1044b UIC - EAST POPLAR OIL FIELD ENFORCEMENT CASE SDWA 1431 Folder ID: 13647 1952 Privileged

Rolease in TIII

Region 8 13647

EPU #1 History 19 pays

EPU #1 History 19 Pages 1950 - 1988

Fixe early

EAST POPIAR UNIT WELL NO. 1

ROOSEVELT COUNTY, MONTANA

MURPHY CORPORATION - OPERATOR

INDEX

EAST FOPLAR UNIT WELL NO. 1

ROOSEVELT COUNTY, MONTANA

MURPHY CORPORATION - OPERATOR

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HISTORY

SUMMARY OF WELL RISTORY

WELL MAME AND NUMBER:

East Poplar Unit Well No. 1

LCCATION:

SW NE Sec. 2, T28N, R51E

DRILLING UNIT:

Wildet

WORKING INTEREST:

31.48570% (1956)

REVENUE INTEREST:

24.6108470% (1956)

ELEVATION:

2111; Ground - 2123; R.K.B.

WELL HEAD MARKER:

R.K.B. to top of 13 3/8" casing head flange-12.30

CONTRACTOR:

Cook Drilling Company

SPUDDED:

10:45 P.M., September 16, 1951

COMPLETED:

March 10, 1952

TOTAL DEPTH:

9153' Schlumberger - 5827' PBTD

CASIM:

13 3/8" @ 1013.00' u/700 ax cement 7" @ 5813.75' u/200 ax cement

INITIAL PRODUCTION INTERVAL:

Parf. "C" Zone 5799-5811: 4/6 bullets per ft.

"C" Zone - Coen hole 5814-58279

Perf. "B-1" & "B-2" Zones 5548-5680' w/4 jet

shots per ft.

TUBING:

2 1/2" set in packer at 5750°

PACKER

Baker Model "D" Production Packer @ 5750"

INITIAL POTENTIAL:

"B-1" & "B-2" Zones Co-mingled. Flowed on 10/64" choke 24 hrs. (233 BOPD, .6% water)

CFP 525#

"C" Zone flowed on 8/64" choke 24 hrs. (252

BOPD, .6% water) TFP 800%.

INITIAL ACID TREATMENT:

None

INITIAL PRAC TREATMENT:

None

TYPE COMPLETION:

Dual Completion w/the "B-1" & "B-2" Zones flowing co-mingled through the casing and the

"C" Zone flowing through the tubing.

	DEGGOVERNI I HOLE	i
	DISCOVERY WELL Well No. 10-A	: <i>'</i> .
	19696 GC 1000 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	3
۶.		<u> </u>
	Well 3 Name C. H. Murphy Jr - Twp. 28 N. Ind. 12892,	ģ.
•	#1 Unit, Well #1 Rge. 51 E	.51
	Foot Ponlan Proposit	20
	East Poplar Prospect Sec. 2	ŀ
•	ROOSEVELT C SW NE: 5	1
	Montana	11-
	Surface Elevation and Formation	11-
	2123 API # 25 OV> @ 05058	==.
	Landowner	;
	Unitized Ind. 12892	LE
٠		-I.
•	C.H. Murphy Jr.	Br
•-	Drilling Company	-on
	C.H.Murphy Jr.	it
•	Representative in Charge	a
•	- Circumstance - Circ	-01
:	Contractor or Driller	No
:	Date Location Date Spudded	th
		-be
'	9-15-51	on
.	8-18-51 Loc (MOJ)	51.
	9-7-51 RURT (FCP) LOG IN FILE	-wa
	9-21-51 Drilling 800 (FCP)	hi
		and
i	9-29-51 WOC 1057, 1013' of 13-5/8"	
	w/ 700 sx. Jud Riv 1025 (FCP)	1
	10-5-51 Drilling 3124 (FCP)	W
. !	10-10-51 Drilling 4772 (FCP)	12
	10/19/51 Drilling 5134, DST 4772-478	
		,
	in Amsden, open 30 min. weak blow	
	24 min; Rec 30' of 41° oil and gas	12-
1	cut mud, and 85° brackish water;	
ا	no pressures taken (FCP)	12
,	Completed Total Depth Formation	Mi
	2-20-52 9163 Ordovician	
!	Oll Gas Water	1-5
- 1		

Flow 354 BOPD thur 1/8" choke

10±26-51 Drilling 5674; Kibbey 170; Report unconfirmed DST made 000' oil in 20 min, from Madison (FCP) 1-5-51 Drilling 5809 (FCP) -9-51 Drilling 5818 (FCP) -16-51 WOC 5830 ·7" at 5814 w/ 200 sx (FCP) ETTER FROM FCP: dated 11-5-51 to J. Hares, Supt Ohio Oil Co. ridger: That Murphy well at Poplar was the ne I talked to you about. Guess t's extra good, because one DST wit 100 ft. water cushion got 4250' of ll in the hole, open only 20 minute ot too bad, now let's see what ney do about it. Carter Oil will e down to the same horizon shortly Poplar. They were drilling at .43 last week, and Murphy's DST is from 5668-5692. If Carter ts, Poplar Dome will be very hot d so will any acreage there. 1-21-51 Drilling 5890, Kibbey 5160 Water (Sul) 5383 (FCP) 2-7-51 Drilling 6145, 7" at 5814 w 200 sx. Kibbey 5160 Sulphur water 5833 (ECP) -14-51 Coring 6372 (FCP)

12-21-51 Coring 6990, Charles 5320? Mission Canyon 5640 (FCP)

1-5-52 Coring 7394 DST 5668-920PEN using 1000 water cushion, open 20 min

Final Result & 232 BOPD thur 10/64" chokeec water cushion and 4150 oil; 5833, Wul Water (FCP)

LEASE No. 3858

UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF INDIAN AFFAIRS

CONTRACT No. I = 3.7.128.9.7...

- 206][60807

AUR TENTE TO	DEPARTMENT OF THE IN	TERIOR
BR' us	BUREAU OF INDIAN AFFA	urs "
10 1 28 10		
DEP 10 1 58 PH'88	•	
TO THE OF TORDS ASS	IGNMENT OF MINI	NG LEASE
TITLES & REDN	Idividition of Milita	III IIIII
111 SEL 1101		• • • •

Whereas, t	he Secretary of	the Interior or his	authorize	·; d representat	ive has heretofor	re approved
Oil and Ga	S	mining lease, dat	ted Jul	y 31,	***************************************	, 19.50 ,
entered into by a	and between	Birdie Leste	r Vance	et ux		, lessor,
•			•		•	
covering the foll	owing-described	lands in the Fo	rt Peck	Reservation, Pur	ion blo, Nation, etc., as need	
in the State of	rownship 28	North, kande	5l Eas		· · · · · · · · · · · · · · · · · · ·	
	Section 10: Section 15: Section 21:					
		· · · · · · · · · · · · · · · · · · ·				
· · · · · · · · · · · · · · · · · · ·	. ·	· · · · · · · · · · · · · · · · · · ·				
Now, Ther		n consideration of				
considerat	ion	dollars (\$_10	0.00), the receipt	of which is here	by acknowl-
- 1 · · · · · · · · · · · · · · · · · ·		lstar Corporatio				
	: .	i lease, hereby barg				
•					•	
dir or it.			I	ight, title, an	d interest in and	to said lease,
•						
subject to the a	pproval of the S	ecretary of the Inte	erior or his	authorized re	presentative to	
Murphy Oil	l USA, Inc.				, of .200Pe	achStreet
El Dorado	71730	d assignment to be e				
of the Interior	or his authorize	d representative.		•		
In Witnes	s Whereor, the	said assignor has h	nereunto se	t <u>his</u>	hand and seal, th	is 19 %
day of	·	, 19.87	ri ntiko			
		3701		WELLSTAR (ORPORATION .	
ngra n Light in			O B	y Wal Walter May	To Mu ver, President	<u>y.</u>
		1000	A COLOR	y Dog	othy m	agen_
	•	100	OVE OF	*;	/Secretary	

LEASE No. 17777 (78)

5-154 e (August 1961)

UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF INDIAN AFFAIRS

CONTRACT No. 1-37-Ind-12897

WHEREAS, the Secretary of the Interior or	his authorized representative has heretofore approved
OIL AND GAS mining lease,	dated July 31 , 19 50 ,
ntered into by and between Birdie Lester Va	nce and Leroy Vance, husband and wife, lessor,
ndC. H. MURF	PHY, JR. lessee,
overing the following-described lands in the	FORT PECK INDIAN RESERVATION
the State ofMONTANA, COUNTY OF ROOSEV	(Tribett histole of these various, i dading the work as more can
Township 28 North, Range	
Section 10: NW/4, W/2 SW	/4
Section 15: W/2 NW/4	
Section 21: SE/4 NE/4	
Now, Therefore, for and in consideration of	of Ten and more
dollars (\$\frac{1}{2}	0.00), the receipt of which is hereby acknowl-
dged, the saidFAIRWAY RESOURCES, INC.	
he owner of the above-described lease, hereby ba	rgains, sells, transfers, assigns, and conveys
	right, title, and interest in and to said lease,
	right, title, and interest in and to said lease,
	16
ubject to the approval of the Secretary of the I	nterior or his authorized representative to
WELLSTAR CORPORATION	of 9704 State Highway
Platteville, CO 8065 Said assignment to be	e effective from date of approval hereby by the Secretary
f the Interior or his authorized representative.	
	16th
IN WITNESS WHEREOF, the said assignor ha	s hereunto set <u>his</u> hand and seal, this <u>16th</u>
ay of 10 2 SEPTEMBER , 19 86	FAIRWAY RESOURCES, INC.
TTEST C	By: She Shelm
Market Signature	Steven A. Roitman, President
David Rottman, Secretary	Steven A. Roitman, President

5-154 e (August 1961)

UNITED STATES CONTRACT NO.

DEPARTMENT OF THE INTERIOR

BUREAU OF INDIAN AFFAIRS

٠:	Lease No. 52 3858	•
	CONTRACT No. 1-3712897	

.206....60807

WHER	EAS, the Secre	tary of the I	nterior or his	authorized	l representat	ive has heretofo	re approved
Oil an	d Gas	miı	ning lease, date	d July	31,	***************************************	, 19.50 ,
entered in	to by and betw	een Bir	die Lester	Vance	et ux	***************************************	lessor,
and C.	H. Murphy	, Jr.		· · · · · · · · · · · · · · · · · · ·	·	:	, lessee,
covering th	ne following-de	scribed lands	in the For	t Peck	Reservat	ion blo, Nation, etc., as noe	
in the Stat	e ofM	ontana					
	Townsn	ıp 28 Nor	th, Rangé	51 East	<u>.</u>	•	:
	Sectio	n lu: Nwā	. Waswa				······································
	Sectio Sectio	n 15: WāN n 21: SE4	NE 1			de la companya de la	
%		• •	:			gana garrigan in a see	
e i e tra est					•	•	
· · · · · · · · · · · · · · · · · · ·	2.2						
Now,	THEREFORE, fo	r and in con	sideration of	Ten do	ollars an	d other val	.uable
			_		•		Y.
Conside	eration		dollars (\$_10.	00), the receipt	of which is her	eby acknowl-
	: baiu <u></u>	protection					
the owner	of the above-d	escribed lease	, hereby bargai	ins, sells, t	ransfers, ass	igns, and convey	/S
all or	fits				abt title an	l interest in and	to said lease
				11	girt, title, all	i interest in and	. W said lease,
•			·				
	_						
subject to	the approval o	f the Secreta	ry of the Inter	ior or his a	authorized re	presentative to	
Murphy	Oil USA,	Inc.				, of .200Pe	ach Street
	7.	1730					, 200, 2000
El Don	ado, AR	Said assig	mment to be eff	ective from	n date of app	roval hereby by	the Secretary
of the Int	erior or his au	horized repr	esentative.	•			
In W	ITNESS WHERE	OF, the said :	assignor has he	reunto set	_his_	hand and seal, t	his 23rd
day of	January Volony J	N N	, 19. <i>LZ</i>	_ <u>T</u>]	PEX Explora		
- Enic	CT	9 T		<u>B</u> y		M J T T T T T T T T T T T T T T T T T T	
	SCALS:		·	Ht.	inter S. Sv	anson, Presi	dent

LEASE No. 17777(78) # 42

5 -6 4 2 9 (August 1961)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF INDIAN AFFAIRS

CONTRACT No. 1-37 Ind-12897

Whereas, th	e Secretary of the Interior or his authorized representative has heretofore approved
Oil and Gas	mining lease, dated July 31 , 1950,
entered into by a	nd between Birdie Lester Vance and Leroy Vance, wife and husband lessor,
and	C. II. Murphy, Jr. , lessee,
covering the follo	Fort Peck Indian Reservation
in the State of	(Insert name of Reservation, Pueblo, Nation, etc., as beeded) Montana, County of Roosevelt
	Township 28 North, Range 51 East M.P.M.
	Section 10: NW/4, W/2 SW/4
	Section 15: W/2 NW/4
	Section 21: SE/4 NE/4
Now. There	FORE, for and in consideration ofTen and more
	dollars (\$\frac{10.00}{}), the receipt of which is hereby acknowl-
	Partnership Properties Co.
all of its	above-described lease, hereby bargains, sells, transfers, assigns, and conveys
	right, title, and interest in and to said lease,
subject to the ap	proval of the Secretary of the Interior or his authorized representative to Fairway
	87.5%, TPEX Exploration, Inc 12.5% of 1536 Cole Boulevard, S
	do 80401 Said assignment to be effective from date of approval hereby by the Secretary
of the Interior o	his authorized representative.
IN WITNESS	WHEREOF, the said assignor has hereunto set hand and seal, this 15/h
day of Jan	DADINEDCUID DOODEDITIES CO
	By Julasteh
	Charles E. Holmes
	Attorney-in-fact
10-11003-0	(OAES)

206 60807

LEASE No. 17777 (78)

5-154 e (August 1961)

UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF INDIAN AFFAIRS

CONTRACT No. 1-37-Ind-12897

il and gas	mining lease, dated approved July 31 , 19 50
ntered into by and bet	tween Birdie Lester Vance and Leroy Vance, wife and husband lessor
nd	C. H. Murphy, Jr. , lessee
overing the following-	described lands in the Fort Peck Indian Reservation
	Montana, County of Roosevelt:
	Township 28 North, Range 51 East M.P.M.
	Section 10: SW/4, W/2 SW/4
	Section 15: W/2 NW/4
	Section 21: SE/4 NE/4
Now, Therefore,	for and in consideration of
en and more	dollars (\$), the receipt of which is hereby acknowl
edged, the said	Placid Oil Company
the owner of the above-	described lease, hereby bargains, sells, transfers, assigns, and conveys
all of their (50%)	right, title, and interest in and to said lease
TI OI CHOIL (50%)	· · · · · · · · · · · · · · · · · · ·
subject to the approval	of the Secretary of the Interior or his authorized representative to
subject to the approval	of the Secretary of the Interior or his authorized representative to, of
subject to the approval	of the Secretary of the Interior or his authorized representative to, of
subject to the approval Partnership Propert Denver, Colorado of the Interior or his a	of the Secretary of the Interior or his authorized representative to, of 717 Seventeenth S, of
subject to the approval Partnership Propert Denver, Colorado of the Interior or his a	of the Secretary of the Interior or his authorized representative to, of 717 Seventeenth Seventeenth Secretary of a said assignment to be effective from date of approval hereby by the Secretary of the said assignment to be effective from date of approval hereby by the Secretary of the said assignment to be effective from date of approval hereby by the Secretary of the said assignment to be effective from date of approval hereby by the Secretary of the said assignment to be effective from date of approval hereby by the Secretary of the said assignment to be effective from date of approval hereby by the Secretary of the said assignment to be effective from date of approval hereby by the Secretary of the said assignment to be effective from date of approval hereby by the Secretary of the said assignment to be effective from date of approval hereby by the Secretary of the said assignment to be effective from date of approval hereby by the Secretary of the said assignment to be effective from date of approval hereby by the Secretary of the said assignment to be effective from date of approval hereby by the Secretary of the said assignment to be effective from date of approval hereby by the Secretary of the said assignment to be effective from date of approval hereby by the Secretary of the said assignment to be effective from date of approval hereby by the Secretary of the said assignment to be effective from date of approval hereby by the Secretary of the said assignment to be effective from date of approval hereby by the Secretary of the said assignment to be effective from date of approval hereby by the Secretary of the said assignment to be effective from date of approval hereby by the Secretary of the said assignment to be effective from date of approval hereby by the Secretary of the said assignment to be effective from date of approval hereby by the Secretary of the said assignment to be effective from date of approval hereby by the Secretary of the said assignment to be effective from
subject to the approval Partnership Propert Denver, Colorado of the Interior or his a IN WITNESS WITE	of the Secretary of the Interior or his authorized representative to, of 717 Seventeenth S, of Said assignment to be effective from date of approval hereby by the Secretar authorized representative.
subject to the approval Partnership Propert Denver, Colorado of the Interior or his a	of the Secretary of the Interior or his authorized representative to

ASSIGNED EFFECTIVE 12/31/52 FROM C.H. MURPHY, Jr. ALL TO: PLACID OIL CO. 16/32
Wm. & THEODOSA NOLAN1/32

ASSIGNED EFFECTIVE 9/29/54 FROM MURPHY TO: MARINE OIL 1/4 OF 15/32 OR 15/128 OWNERS: MURPHY 45/128, PLACID OIL CO. 64/128, NOLANS 4/128, & MARINE OIL 15/128

ASSIGNED EFFECTIVE 4/1/55 FROM MARINE OIL TO Wm. J. SHERRY 1/4 OF 15/128 OR 15/512 OWNERS: MURPHY 180/512, PLACID OIL CO. 256/512, NOLANS 16/512, MARINE OIL 45/512, & Wm. J. SHERRY 15/512

ASSIGNED EFFECTIVE 4/4/55 FROM Wm. J. SHERRY TO: MURPHY 1/4 OF 15/512 OR 15/2048

OWNERS: MURPHY 735/2048, PLACID OIL CO. 1024/2048, NOLANS 64/2048, MARINE OIL 180/2048,

& Wm. J. SHERRY 45/2048

ASSIGNED EFFECTIVE 4/2/82 FROM PLACID OIL CO. TO: PARTNERSHIP PROPERTIES COMPANY- ALL OWNERS: MURPHY 735/2048, NOLANS 64/2048, MARINE OIL 180/2048, Wm. J. SHERRY 45/2048, PARTNERSHIP PROPERTIES COMPANY 1024/2048

ASSIGNED EFFECTIVE 12/16/86 FROM PARTNERSHIP PROPERTIES COMPANY TO: FAIRWAY RESOURCES, INC. (896/2048), & TPEX EXPLORATION, INC. (128/2048)

OWNERS: MURPHY 735/2048, NOLANS 64/2048, MARINE OIL 180/2048, Wm. J. SHERRY 45/2048,

FAIRWAY RESQUECES, INC. 896/2048. & TPEX EXPLORATION, INC. 128/2048

SSIGNED EFFECTIVE 12/16/86 FROM FAIRWAY RESOURCES. INC. (896/2048) TO:WELLSTAR CORPORATION

ASSIGNED EFFECTIVE 12/16/86 FROM FAIRWAY RESOURCES, INC. (896/2048) TO:WELLSTAR CORPORATIO (896/2048)

ASSIGNED EFFECTIVE 3/19/87 FROM: TPEX EXPLORATION, INC. (128/2048) TO: MURPHY OIL USA, INC.

ASSIGNED EFFECTIVE 3/19/87 FROM: WELLSTAR CORPORATION (896/2048) TO: MURPHY OIL USA, INC.

ADAPTED FROM . FORM 5-154E

5 345 35.53

UNITED STATES

Contract No.

I-37-Ind-1289' Lease No. 385

OLGEL HO DEPARTMENT OF THE INTERIOR 2544-4942)

HO SOOS THEOREM OF INDIAN AFFAIRS TO DETERM
CALBUQUE SHE ORIEN GOTT

LOS MEDITO

	gyranicing in higher that Manight 19 and in the land
approveda, and the substitution savies of action of a substitution of a substitut	rangerand at the weath and
and C. H. MURPHY, JR., Lessee, covering the following varion in the State of Montana, County of Roosevelt:	en in a the estigation and tour dester or sold bosses in
The Called Same of a penal demonstry Com-	per a less destant real regrets en superir en fine bond.
Township 28 North, Range Sec. 10: NW/4; W/2 SW/ Sec. 15: W/2 NW/4	51 East M.P.N.
Sec. 21: 8E/4 NE/4	
Assistant Secretivy	gribera i sa jiji antin
ATTESE	BEST BY CONDUCTION
day of 1957	
IN WITNESS WITH AROUST the soid assigned be	character of he land and and this
lary of the Interior, hereby accepts such assignment stipulations in sold or actived indentate of lease, wh	annual, made subject to the approval of the Secre- tond agrees to folfill all childedones, correlations, and on essigned, and the coles, and regulations of the furnish proper bond guarantering a faithful com-
WHEREAS, the above described lease is subje No. 869, approved by the Assistant Commissioner by the Acting Director of the United States Geologi	ct to a certain Unit Agreement designated I-Sec. of Indian Affairs on August 22, 1951, and approved cal Survey on August 23, 1951; and
Oklahoma, is the present owner of an undivided in	
of which is hereby acknowledged, the said WILLI assign and convey unto MURPHY CORPORATIO	n of TEN AND MORE dollars (\$10.00), the receipt AM J. SHERRY does hereby bargain, sell, transfer, N, a Louisiana Corporation, of El Dorado, Arkanterest in and to the lease hereinabove described, val hereof by the Secretary of the Interior.
IN WITNESS WHEREOF, the said assignor ha	sthereunto set his hand and seal; this ****! 5th outles
day"of - artista governber s watern themanis 1954,04 s	eknowled by to me mut he exemied the same.
South Called part and appeared William A.	WILLIAM J. SMERRY (L.S.)
	▼
STATE OF SALES OF SAL	VER)

(OVER)

ACKNOWLEDGMENT OF CORPORATION

Area Director

Contract No.

I-37-Ind-12897

UNITED STATES

FORM 5-154E ...

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ADAPTED PHOM PORM 5-154R

UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF INDIAN AFFAIRS

Contract No. I-37-ind-12897 Our Lease No. 3858

ASSIGNMENT OF MINING LEASE

WHEREAS, the 6e		•				
July 31, 1950		nto by and betwee	n Birdie	rester	Agrice and	· · · ·
Leroy Vence, wife	band husband				· ·	, lessors,
and C. H. MURPHY, JR.	, lessee, covering th	e following describ	ed lands in the	e Fort Pecl	c Indian Re	servation in the
State of Montana, Count	y of Roosevelt:			:		
. •	Township 28 No. 8ec. 10: 1 Sec. 15: 1 Sec. 21: 8	14/4; W/2 SW/4 1/2 HW/4		1.		٩
			•	•		
	1674°					
	٠					
	e ^c	·. ·		-		
			T1771.			
WHEREAS, the all approved by the Assistantor of the United States	it Commissioner of	Indian Affairs on	August 22, 19	greement of green	designated] proved by th	I-Sec. No. 869, se Acting Direc-
AND WHEREAS, terest in the above-describ ana Corporation of El De	the Secretary of the	ne Interior has her	etofore approv			
NOW, THEREFO is hereby acknowledged, veys, an undivided one-form Arkansas Corporation by the Secretary of the I	the said MURPH ourth (1/4) right, t , of El Dorado, A	Y CORPORATION itle and interest in	ON hereby bary and to said	gains, sells, lease to M	transfers, a	ssigns, and con- L COMPANY,
IN WITHESS WH	EREOF, the said a	ssignor has hereur	to set its hand	and seal,	this	oth day of
Z. S. J. J. J. J. J. J. Attest.	Dunco	MUF By_	APHY CORPO	LA SA		
Assistant On Coastd L	nt Secretary . Durrett	(OVER)	Explor	ation Ma	nager	

W CHUCHWADED STATES DEPARTMENT OF THE INTERIOR BUREAU OF INDIAN AFFAIRS

Contract No.

I-37-ind-12897

Our Lease No.

ASSIGNMENT OF MINING LEASE

... 3 # A. . -

emproved July 31, 1950, entered into by and be	etween Birdie	Lester Vance an	<u>d</u>
Leroy Vence, wife and husba	•	· .	, lessors,
and C. H. MURPHY, JR. lessee, covering the following	g described lands in	the Fort Peck India	an Reservation
in the State of Montana, County of Roosevelt:	, , .		18379
Marsachin 28 Manth Banco El	Back M D M		and the second s
Founship 25 North, Range 51 Sec. 10: Wit, Wi 6Wi Sec. 15: Wi Wit Sec. 21: 6Ei BEi	1.4."	÷. v.	, - , -
·			•
An experience of the second se	e produce services		
	1. 6:813 7 3 - 7	. Sk	
AND WHEREAS, the above-described lease is subj 869, approved by the Assistant Commissioner of India Acting Director of the United States Geological Surve NOW, THEREFORE, for and in consideration of which is hereby acknowledged, the said C. H. MURP by bargains, sells, transfers, assigns and conveys all of h to the approval of the Secretary of the Interior, to M of El Dorado, Arkansas, an undivided fifteen thirty-s a Delaware Corporation of Shreveport, Louisiana, an CINOLAN AND THEODOSIA M. NOLAN of El Do	n Affairs on August y on August 23, 195; TEN AND MORE HY, JR., the owner is right, title and inturphy CORPORA econds (15/32) intercundivided one-half rado, Arkansas, an u	22, 1951, and apl: dollars (\$10.00), of the above-describerest in and to said TION, a Louisian est; to PLACID OI (1/2) interest; and ndivided one thirty	the receipt of oed lease, hered lease, subject a Corporation L COMPANY, to WILLIAM recond (1/32)
interest; said assignment to be effective from date of a IN WITNESS WHEREOF, the said assignor has h	;		
July 19 52			
100 242 - 1.110 V		/	
CHERT FARM	CA.h	- lay	<u> </u>

(OVER)

206 60807 Contract No. I-37ind-

(May 1949)

UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF INDIAN AFFAIRS 3858

OIL AND GAS MINING LEASE—ALLOTTED INDIAN LANDS TO SELECT THE STATE OF Assiniboins-Sious TRIBÉ, STATE OF The control of the co Birdie Legter Vence and Lercy Vence. WELV OF THOMA De ... 6.34 -- 12.23 THE STATE OF THE S The first section of such and section for the first section of the UN 191950 12668 Weedlagton, on Hottoe No. 200 2031g T. 116 St. of less Anneles, suggest of the State of California Washington, pollotted No. 12668 (roll No. 1987), of the State of the State of Tribe of Indians, designated herein as the provided the state of the S of lessed new to the lessed as a superintendent, receipt of which is hereby acknowledged, and in consideration of rents and royalties to be paid; and the covenants to be observed as herein set forth, does hereby grant and lease to the lessee the exclusive right and privilege to drill for, mine, extract, remove, and dispose of all the oil and natural gas deposits in or under the followingthe off to a fire emperation. barticiparly, descriped as topositing in the form prescribed by the Secretary of the Justice of all the wells drilled by the lessest described tracts of languages the secretary of the Justice of all the wells drilled by the lessest and mode described tracts of languages. (d) Moninflus. Telegrate of the state of the 800 21 - 82 HR RECEIPEL containing acres more or less, together with the right to construct and maintain thereupon all works, buildings, plants, waterways, roads, telegraph and telephone lines, pipe lines, reservoirs, tanks, pumping stations, or other structures necessary to the full enjoyment hereof for the term of 10 years from and after the approval hereof by the Secretary of the Interior and accommodal processes and accommodal processes are of land or gas is produced in paying quantities from said land, common to some less not all the first of the constructions. 2. The term foll and gas supervisor has employed herein shall refer to such officer or officers as the Secretary of the Interior may designate to supervise oil and gas operations on Indian lands. O'The term "superintendent" as used herein shall refer to the superintendent or other official in charge of the Indian Agency having jurisdiction over the lands leased. 3. In consideration of the foregoing, the lessee hereby agrees:

(d) Bond.—To furnish such bond as may be required by the regulations of the Secretary of the Interior, with satisfactory surety, or United States bonds as surety therefor, conditioned upon compliance with the terms of this lease.

(b) Wells.—(1) To drill and produce all wells necessary to offset or protect the leased land from drainage by wells on adjoining lands not the property of the lessor, or in lieu thereof, to compensate the lessor in full each month for the estimated loss of royalty through drainage: "Provided; That during the period of supervision by the Secretary of the Interior, the necessity for offset wells shall be determined by the oil and gas supervisor and payment in lieu of drilling and production shall be with the consent of, and in an amount determined by the Secretary of the Interior; (2) at the election of the lessee to drill and produce other wells: Provided; That the right to drill and produce such other wells shall be subject to any system of well spacing or production allotments authorized and approved under applicable law or regulations, approved by the Secretary of the Interior and affecting the field or area in which the leased lands are situated, and (3) if the lessee elects not to drill and produce such other wells for any period the Secretary of the Interior may, within 10 days after due notice in writing, either require the drilling and production of such wells to the number necessary, in his opinion, to insure reasonable diligence in the development and operation of the property, or may in lieu of such additional diligent drilling and production require the payment of sand after the first anniversary date of this lease of not to exceed \$1 per acre per annum, which sum shall be in addition to any rental or royalty hereinafter specified. hereinafter specified.

15-17803-8

MARKET ST.

- 7. Removal of buildings, improvements, and equipment.—Lessee shall be the owner of and shall have the right to remove from the leased premises, within 90 days after termination of this lease, any and all buildings, structures, casing, material, and/or equipment placed thereon for the purpose of development and operation hereunder, save and except casing in wells and other material, equipment, and structures necessary for the continued operation of wells producing or capable of being produced in paying quantities as determined by the Secretary of the Interior, on said leased land at the time of surrender of this lease or termination thereof; and except as otherwise provided herein, all casing in wells, material, structures, and equipment shall be and become the property of the lessor.
- 8. Relinquishment of supervision by the Secretary of the Interior.—Should the Secretary of the Interior, at any time during the life of this instrument, relinquish supervision as to all or part of the acreage covered hereby, such relinquishment shall not bind lessee until said Secretary shall have given 30 days written notice. Until said requirements are fulfilled, lessee shall continue to make all payments due hereunder as provided in section 3 (c). After notice of relinquishment has been received by lessee, as herein provided, this lease shall be subject to the following further conditions:
- (a) All rentals and royalties thereafter accruing shall be paid in the following manner: Rentals and royalties shall be paid directly to lessor or his successors in title, or to a trustee appointed under the provisions of section 9 hereof.
- (b) If, at the time supervision is relinquished by the Secretary of the Interior, lessee shall have made all payments then due hereunder, and shall have fully performed all obligations on its part to be performed up to the time of such relinquishment, then the bond given to secure the performance hereof, on file in the Indian Office, shall be of no further force or effect.
- (c) Should such relinquishment affect only part of the acreage, then lessee may continue to drill and operate the land covered hereby as an entirety: Provided, That lessee shall pay in the manner prescribed by section 3 (c), for the benefit of lessor such proportion of all rentals and royalties due hereunder as the acreage retained under the supervision of the Secretary of the Interior bears to the entire acreage of the lease, the remainder of such rentals and royalties to be paid directly to lessor or his successors in title or said trustee as the case may be, as provided in subdivision (a) of this section.
- 9. Division of fee.—It is covenanted and agreed that should the fee of said land now or hereafter be divided into separate parcels, held by different owners, or should the rental or royalty interests hereunder be so divided in ownership, the obligations of lessee hereunder shall not be added to or changed in any manner whatsoever save as specifically provided by the terms of this lease. Notwithstanding such separate ownership, lessee may continue to drill and operate said premises as an entirety: Provided, That each separate owner shall receive such proportion of all rentals and royalties accruing after the westing of his title as the acreage of the fee, or rental or royalty interest, bears to the entire acreage covered by the lesse; or to the entire rental and royalty interest as the case may be: Provided further, That if, at any time after departmental upervision hereof is relinquished, in whole or in part, there shall be four or more parties entitled to rental or joyalties hereigher, whether said parties; are so entitled by, virtue of undivided interests or by virtue of ownership of separate backets hereighed and thereby, lessee, at his election may withhold the payment of further rentals or royalties (except as to the portion due the Indian lessor while under restriction), until all of said parties shall agree upon and designate in writing and in a recordable instrument a trustee to receive all payments due hereunder on behalf of said parties, and their respective successors in title... Payments to said trustee shall constitute lawful payments hereunder, and the sole risk of an improper or unlawful distribution of said funds by said trustee shall rost upon the parties naming said trustee and their respective successors in title.

DEPARTMENT OF THE INTERLIRE

- 10. Drilling and producing restrictions.—It is covenanted and agreed that the Secretary of the Interior may impose restrictions as to time or times for the drilling of wells and as to the production from any well or wells drilled when in his judgment such action may be necessary or proper for the protection of the natural resources of the leased land and the interests of the Indian lessor, and in the exercise of his judgment the Secretary may take into consideration, among other things, Federal laws, State laws, or regulations by competent Federal or State authorities or lawful agreements among operators regulating either drilling or production, or both.
- 11. Unit operation.—The parties hereto agree to subscribe to and abide by any agreement for the cooperative or unit development of the field or area, affecting the leased lands, or any pool thereof, if and when collectively adopted by a majority operating interest therein and approved by the Secretary of the Interior, during the period of supervision.
- 12. Helium—public emergency.—It is covenanted and agreed that helium gas, carbon dioxide gas, and all other natural gases are included under the term "gas" as used in this lease; and in the event gas is discovered containing helium the United States Government shall have the right to purchase, at reasonable prices, all or any part of the production and to regulate the amount and manner of production; and in time of war or other public emergency, the United States Government shall have the option to purchase all or any part of the products produced under this lease.
- 13. Conservation.—The lessee in consideration of the rights herein granted agrees to abide by the provisions of any act of Congress, or any order or regulation prescribed pursuant thereto, relating to the conservation, production, or marketing of oil, gas, or other hydrocarbon substances.
- Heirs and successors in interest.—It is further covenanted and agreed that each obligation hereunder shall extend to and be binding upon, and every benefit hereof shall inure to, the heirs, executors, administrators, successors of, or assigns of the respective parties hereto.

The witness whereor, the said parties have hereunto subscribed their names and affixed their seals on the day and year first above mentioned.

mst above mentioned.	
F C Two witnesses to execution by lessor:	XIVI Lesten 7 ansecus
Mayorie N. Boyd	Birdie Lester Vance [BEAL]
PO Poplor Montara	
Sure Redboy	X Leroy Vance [SBAL] Leroy Vance
PO Brackton mont.	12-17-03-4

Supt. Diell Supt. Hick Agency Mil Hin All Nev Aug 4 1950 HAUG 4 1950 Epu +1 PAppln: 4 pags 1951-1959

(SUBMIT IN TRIPLICATE)

UNITED STATES

DEPARTMENT OF THE INTERIOR

OIL CONSERVATION BOARD AND BOARD OF RAILROAD COMMISSIONERS BILLINGS

GEOLOGICAL SURVEY

SUNDRY NOTICES AND REPORTS ON

I-37-Ind-128

NOTICE OF INTENTION TO CHANGE PLANS		SUBSEQUENT REPORT OF REDRILLING OR REPAIR SUBSEQUENT REPORT OF ABANDONMENT. SUPPLEMENTARY WELL HISTORY		
(INDICATE ABOVE BY CHECK MARK NATURE OF REPORT, NOTICE OR OTHER DATA) August 20 19 51				
Well No. 1 is located 1980 ft. fr	om ·	N line and 1980 ft. from E line of sec.	2	

(% Sec. and Sec. Rossevelt (Moridian)

Yontana

(County or Subdivision)

(State or Territory)

The elevation of the derrick floor above sea level is

DETAILS OF WORK

(Sits names of and expected depths to objective sands; show sizes, weights, and lengths of proposed casings; indicate mudding jobs, comenting points, and all other important proposed work)

#111 set 15 3/8" O.D. 48-1b. H-40 surface easing between 750' and 1000' and cement with 500 say or returns to surface. Proposed depth is 45001 to test the Takota-Lakota formation. If at the above depth, we believe the structure to be favorable, then we probably will drill on to test the Devonian formation believed to be above 85001. 5 1/2" casing of proper weight and grade will be run to total depth of any formation thought to be productive.

Expected stratigraphic section:

Judith River 5285 Buddy Sandstone

Morrison

5960 4710

Ameden Devonian

6900

al in writing by the Geological Su

C. R. Murphy, Jr. Company ...

302 U. S. Metional Bank Bldg.

Denver 2, Colorado

District Production Supt

SIIOWN TO CONFITIONS APPROVED SUBJECT ON REVERSE REVERSE

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COMPLETIONS OF APPROVAL

- d. The lessee or operator shall mark the deputed or well in a conspicuous place with the name of the operator, will number have of lessor, contract number, and location of the well and shall take all necessary proproductions to preserve bless markings.
- 2. A cunductor or surface string of casing shall be run and comented from the bettem to surface unless other procedure is expressly authorized by this approval. The conductor or surface string shall be of sufficient weight and length and have installed thereon the proper and necessary high appressure fittings and equipment to heap the limit unforce of trolein case an unexpected flow of gas, oil or water is encountered.
- 3. All showings of oil or gas are to be adequately tested for their commercial possibilities. All showings shall be properly protected by mud, coment or casing so that each showing will be confined to its original stratum. Accessary productions shall be taken to prevent waste or damage to other minerals drilled through and the U.S. Geological Survey, upon request, shall be furnished with carefully taken simples of such minerals as coal, potash and salt.
- 4. Lessee's Monthly Papert of Operations (Form 9-329a) shall be filled inderiplicate with the office of the U.S. Geological Survey, P. O. Box 400, Casper, Lyoning, not later than the sinth of the succeeding month. The report should show for this well any change of status occurring within the particular month such as data drilling commanced, suspended, resumed or completed, total aspth as of the end of the month, and if shut down the reason therefore.
- 5. copies of the log of this well en Form 9-330, or other acceptable form and two copies of all electrical logs, directional, diameter and temperature surveys of the hole shall be filed with the Cliedistrict engineer within 19 days after sache informations is received by operator or completion of the well which ever is earlier:
- 6. The District Engineer, H.H. PERRIGO ELLINGS, MOHTANA

 shall be notified on form 9-321b in triplicate giving thereon all necessary details of the proposed operation or test for proper consideration and action sufficiently in advance of making casing or formation tests, shooting or acidizing, running or comenting casing, other than the surface or conductor string, to permit approval of the notice prior to date of proposed work.

Form No. 2 GENERAL RULES 201, 202, 213, 216, 219, 233.1

(SUBMIT IN QUADRUPLICATE)

TO

NOTICE!
THIS FORM BECOMES A
PERMIT WHEN STAMPED
APPROVED BY AN AGENT
OF THE COMMISSION.

OIL AND GAS CONSERVATION COMMISSIONE OF THE STATE OF MONTANA BILLINGS OR SHELBY

OF THE COMMISSION.

SUNDRY NOTICES AND REPORT OF WELLS FEE 1.3 1957

otice of Intention to Drill	Subsequent Report of Water Shut-offic CIAIS OF HAVING	1
otice of Intention to Change Plans	Subsequent Report of Shooting, Acidizing, Cementing	·
otice of Intention to Test Water Shut-off	Subsequent Report of Altering Casing	1
otice of Intention to Redrill or Repair Well	Subsequent Report of Redrilling or Repair	٠٠;
otice of Intention to Shoot, Acidize, or Cement	Subsequent Report of Abandonment	<u> </u>
otice of Intention to Pull or Alter Casing	Supplementary Well History	<u> </u>
otice of Intention to Abandon Well	Report of Fracturing	
	Workover History X	-

			г	enruary	±22.1	, 19.
Following is a { notice of intention report of work of the state of th	on to do work } on lar	nd owned leased	described	as follows:		
					7-Ind-1289	92
MONTANA	Roose	evelt		E.	est Poplar	•
(State)		(County				Field)
Well No. 1	SW ME Section	on 2	T28N,	R51E		
	(m. sec.)		(Township)		(Range)	(Meridian)
The well is located 1980	ft. from { N X }	line and	1980	ft, from	E }1	ine of Sec2
(Locate accurately on Plat on back of this form the well location, and show lease boundary.)						
The elevation of the derrick floor above the sea level is						

READ CAREFULLY

DETAILS OF PLAN OF WORK

READ CAREFULLY

* - 1

276

c. :

* . **:::** . *

(State names of and expected depths to objective sands; show size, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work, particularly all details results Shooting, Acidizing, Fracturing.)

DETAILS OF WORK RESULT

SEE ATTACHED SHEETS

·		-11. · · · ·
	•	• • •
Approved subject to conditions on reverse of form	Company Murphy Corporation	
Date 2 - 15 - 57	By MI Tomes	c.
By had RI to Sug	Title Field Production Supt.	** 3
District Office Agent	Address Poplar Montana	, °Z'
District Office Agent		

NOTE:-Reports on this Form to be submitted to the District Agent for Approval in Quadruplicate.

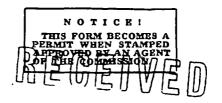
13: - 252

Form No. 2 GENERAL RULES 201, 202, 213, 216, 219, 233.1

(SUBMIT IN QUADRUPLICATE)

TO

OIL AND GAS CONSERVATION COMMISSION OF THE STATE OF MONTANA BILLINGS OR SHELBY



JAN 7 - 1961

SUNDRY NOTICES AND REPORT OF WELLS

	1 11		- 440 OU!		- Dily Mice
Notice of Intention to Drill	· \$	Subsequent Report of Water Shut	t-off OF THE STA	40.14 (10)	Pommies
Notice of Intention to Change Plans	S	Subsequent Report of Shooting, A	t-off OF THE STA	de on the	TATAKA
Notice of Intention to Test Water Shut-off	5	Subsequent Report of Altering Co	asing		
Notice of Intention to Redrill or Repair Well	S	Subsequent Report of Redrilling	or Repair		1
Notice of Intention to Shoot, Acidize, or Cem		Subsequent Report of Abandonm		1	- -
Notice of Intention to Pull or Alter Casing		Supplementary Well History			-
Notice of Intention to Abandon Well	I	Report of Fracturing			
	7	Workover History		X	-
(Indicate Above		e of Report, Notice, or Other Da	12)	<u> </u>	' ك
(r 29		בס
ollowing is a report of work done	on land {	described as follows			, 192
(Topoli of Note Code		LEASE 1-3			
MONTANA	Roose	evelt	East	Poplar	•
(State)	(C	ounty)	(Fiel	d)	••••••
SUNT S	Section 2	28N	51.E	M.P.	M.
		(Township)	(Range)	(Meridi	an)
ell No. 1 SWNE S	.)				2
			SE line	of Coo	
(m. sec ne well is located 1980 ft. from { (Locate accurately on Plat on back of this form the elevation of the derrick floor above the	line ar	nd 1980 ft from show lease boundary.)	{ E XXX }line	of Sec	
ne well is located 1980 ft. from {	betails OF PLAsands; show size, weight	and 1980 ft. from show lease boundary.) 2123! AN OF WORK ghts, and lengths of proposed case	REAL	CARE	FULLY
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NOTE:-Reports on this Form to be submitted to the District Agent for Approval in Quadruplicate.

53 8 90 P 149 R G. D. 149 P 1951 - 1952

BEST COPYS Budget Bureau No. 42-R355.2. Approval expires 12-31-52. Form 9-380 U. S. LAND OFFICE Billings, IN-RECEIVED LEASE OR PERMIT TO PROSPECT EAST POPLAR UNIT 1952 APR 8 UNITED STATES OIL CONSERVATION BOARD OF RAILBOAD COMMISSIONES OF THE INTERIOR REC BILLINGS GEOLOGICAL SURVEY LOG OF OIL OR GAS LOCATE WELL CORRECTLY Address Box 76 Poplar, Montana Company C. H. Murphy, Jr. Lessor or Tract Tast Poplar Unit Field Fast Poplar Unit State Montana Well No. 1 Sec. 2 T. 28 R. R.51E Meridian M. P.M. County Roosevelt Location 1980 ft. S. of N Line and 980 ft. W. of E Line of Sec. 2 Elevation The information given herewith is a complete and correct record of the well and all work done thereon so far as can be determined from all available records. 277 DE # 10/67# Seeks #27 252# 755 Signed Date April 15 11952 Trove and 170 garage and Title District Production Supt. The summary on this page is for the condition of the well at above date. 19 51 Finished drilling Feb. 19 Commenced drilling 800t. 16 JOAN NICH THE TANK OF CAS SANDS OR ZONES
JOAN PRICE AND AND SHEET THE SERVICE OF OIL OR GAS SANDS OR ZONES

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No. 1, from 5648-22 261, 15to 5680

No. 1, from 5648-22 261, 15to 5680 No. 2. from 195799 1 AP 3 1717 to SC582724 1710 34 SLNo. 3, from 1 122 3877. No. 3, from the state of the st Continuous coring withmediantimater and ruled the well to a total No. 1, from 100 420ks, Bair to 1983 found on No. 3, from 100 2883 of from 500 2880 300. An 8 3/4" hole wwas drille CWEING EECOED cores and tests indicating oil Perforated Size 3 gind and at strong Contand balled than 1013 Watl. If plugs or bridges were put in to test for water, state kind of material ased, position, and results of pumping or bailing. Sich the research for the work undigeneers of these were my rimines made in the cusing such this fifth they claims was side the result of the well, give its size and metalion. It the well has been dynamited a seable size yearton, and number It is of the greatest importance to have a complete history of the well. Please state in det24.33 data29 redriller to chance history of the well. Please state in det24.33 data29 redriller to chance was HSTORT OF OIL OR GAS MUDDING AND CEMENTING RECORD Size Amount of mud used Number sacks of cement Method used Mud gravity Where set

ound ? Plug

pump & plug

13 3/8 1013

5814

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(OVER)

TOTAL FERT

Englewood

jefferson

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FORMATION

16-43094-2

Three Forks

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907.1

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C. H. Murphy, Jr.

East Poplar Unit #1, Poplar Area, Roosevelt County, Montana
1980 S/N 1980 W/E 2-23N-51E Elev 2123

Spudded 9-16-51 Comp. 2-19-52

13 3/8" @ 1013 c/w 700 sx 7" @ 5814 c/w 200 sx IP 485 BF, 99% oil

Sch. tops:

Judith River Eagle Niobrara Carlisle Greenhorn Graneros Upper Muddy Muddy Skull Creek Dak. silt Morrison Ellis Rierdon Piper Sh.	753 1145 2005 2120 2350 2544 2677 2899 2943 3112 3505 3898 4077 4255
Piper lm. Spearfish Amsden Kibbey Charles Madison Lodgepole Englewood Three Forks Ordovician sd. Jefferson	4328 4576 4706 5130 5395 5795 (Mission Canyon) 6560 7127 7172 7341 7280

EPU #1 was spudded 9-16-51. A water flow was encountered from 750-830 and required the use of 11 # mud to kill the flow. 13 3/8" surface csg. was set at 1013' and cemented w/700 sx. An 8 3/4" hole was drilled to 5814' with cores and tests indicating oil production from 5799-5822' and from 5648-80'. The hole from 5814-22 was 6 1/8" core hole. 7" OD casing was set at 5814' and cemented w/200 sx. Salt water was found on a drill stem test from 5833-30'. Continuous coring with a 6 1/8" diamond bit carried the well to a total depth of 9163' where Electric logs and a Velocity survey were run.

The well was plugged back with cement to 5827' and casing perforated with 6 bullets per ft. from 5799-5814 and 5648-80. A Baker model "D" packer was set by wire line method at 5750' separating the two zones. 2½" tubing was run and seated in the packer. The well was allowed to flow with the upper zone flowing through the casing and the lower zone through the tubing.

Production after cleaning into burning pits was 252 bbls. oil per 24 hrs. on an 3/64" choke and 800# surface pressure thru the tubing and 233 bbls. oil on a 10/64" hoke and 525# surface pressure thru the casing.

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1-11-52 Drilling 7950 (FCP)
            1-18-52 Coring 8008, Sample Tops: Jud River 1025; Morrison 3595;
               Piper 4250; Tensleep 4575; Amaden 4705; Kibbey 5160; Water, Sulphur,
               at 5833; Charles 5320? Mission Canyon 5640 (FCP)
                  1-25-52 Coring 8289 (FCP)
               2-21-52 Comp 2-20-52, Devonian 7194, Ordovician 8454? T.D. 9163;
                       Will plug back and test Charles Land Madison (FCP)
              3-1-52 T.D. 9163, PB to 5830, starting to test (FCP)
    3-7-52 PB to 5827, DST 5814-27 open 8 hrs. SI none; Rec 3367 fluid,
    900' light mud, 2467' stiff mud w/ abundance free oil; 90' free oil;
    FBHF 1400#, SI 2750#, testing (FCP)
    3-14-52 Perf 5799-5814, 6 shots per foot; Perf 5648-80 4 shots per ft.
    Perf 5814-27 (open hole) 6 shots per ft. Baker production packer set at
    5750, flowed 354 BOPD thru 1/8" choke from 5750-5827 and 232 BOPD thru
    10/64" choke from 5648-5750, tubing pressure 800#, casing pressure 525#
                                                                                               Comp 2-20-52
   e hadin 15 to reco
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            J. dealers are the
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PHILLIPS PETROLEUM COMPANY March 28, 1952

Considential Recd From See Seymour of phillips 4-15-52

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EAST POPLAR #1

C. H. Murphy, Jr., et al #1 East Poplar Unit, C SW NE, Section 2, T-28N, R. 51E, Roosevelt County, Montana.

Elevation - 2111 Ground, 2123 Kelly Bushing.

Commenced 9/15/51 were was a sure of the commenced of 9/15/51

Completed - 3/ /52

Casing Record - 13-3/8" @ 1013' w/700 sx. 7" @ 5814' w/200 sx. Schlumberger Tops - Judith River 752, Claggett 860, Eagle 1145, Niobrara 2005, Carlile 2120, Green Horn 2350, Upper Muddy 2677, Lower Muddy 2898, Skull Creek 2933, Dakota Silt 3112, Dakota 3178, Kootenai 3217, Second Cat Creek 3315, Third Cat Creek 3444, Morrison 3505, Ellis 3898, Rierdon 4077, Piper Shale 4255, Piper Lime 4328, Gypsum Springs 4376, Spearfish (?) 4575, Amsden 4706, Heath 4835, Otter 4938, Kibbey 5130, Charles 5395, Mission Canyon 5940 (?), Lodgepole 6560, Kinderhook 7127, Three Forks 7170, Jefferson 7280, Ordovician 8185 (?), Lower Ordovician Sand 9041.

Total Depth 9163. Plugged Back 5827

DST 2904-2921, $1/2^n \times 3/8^n$ chokes, 500' water cushion, open 15 min., closed 10 min, rec. 500: water cushion, 300: brackish water, slightly mud cut with trace oil and gas, FP 150-165#, SIP 1150#, HP 1150#.

DST 4772-86, $3/8\pi \times 3/8\pi$ chokes, 500! water cushion, op 30 min., very weak blow for 25 min., no blow for 5 min., no shut in attempted, rec 500' water cushion and 85° brackish water (salt 3800 ppm) and 30° oil and gas cut mid (oil 41°) and approximately 1 qt. free oil, FP 200-200#, HP 2700#.

DST 5170-83, $1/4^n \times 1/4^n$ chokes, no water cushion, open 20 min., closed 10 min. rec. 22401 fluid, 401 RHM and 2200 SW, slightly cut with oil and gas, FP 250-1100#, HP 2900#.

DST 5664-82, 1/4" x 1/4" chokes, 500' wtr cushion, open 20 min., SI 8 min., packer gave way at end of 8 min., fair blow throughout, rec 4185! total fluid; 500! water cushion, 500' oil and gas cut mid, 3185', 38.3° gravity green oil with slight sulphur odor. FP 1600-2000#, SIP 2600#, HP 3075#

DST 5814-22, 4/8 x 1/4 chokes, 961 water cushion, packer set at 5745 in casing. Water Cushion to surface in 38 min., mud to surface in 1 hr. 28 min., oil to surface in 1 hr. 47 min., gauged 33.06 barrels 1st hr., 18.24 next 30 min., top flowing pressure 1/h choke, 250#, SI-15 min., Tp 750#. Opened tool 1 hr., flowed 26.22 bbls. $3/16^n$ top choke, TP 450#; SIP 800#, FP $(\frac{1}{4}^n)$ 1250—2435#, FP $(3/16^n)$ 2680#, FP $(1/8^n)$ 2309#, SIP 3001#, HP 3200#. (Shut in 4 hrs.)

DST 5833-80, 5/8" x 1/4" chokes, no water cushion, gas to surface in 2 hrs. 20 min., mud to surface in 2 hrs. 40 min., flowed mud, oil and gas cut sulphur water, no gauge, TFP 8#, SI 10 min., TSIP 560#, Broke circ, disc., reversed out fluid in tubing, fluid being mud, oil and gas cut sulphur water, fluid from bottom of tubing was black sulphur water w/little gas, FP 50-2420#, SIP 2940#, HP 3040#.

(continued next page)

East Poplar #1 Page 2 March 28, 1952

DST 5918-26, 5/8" x 1/4" chokes, no water cushion, tool open 25 min., rec. slight blo for 2 min., reset tool 5 times, rec 640' mud, no trace of oil or water, FP 0-320#, SIP 2905#, HP 3260#

DST 5939-5960, 5/8" x 1/4" chokes, no water cushion, open 2 hrs., closed 20 min., mud to surface in 31 min., sulphur water to surface in 1 hr. 51 min., TFP 4" choke 165#, TFP 1" choke 35#, TSIP 425#, HP 3050#, FP 2035-2850#, SIP 3055#.

DST 6077-6145, 5/8" x 1/4" chokes, no water cushion, open 3 hrs., closed 30 min., weak, steady blow for 2 hrs, very weak blow for 1 hr., no gas to surface (shear pin in circ. stub sheared while coming out of hole which let fluid in or out of drill, depending on relative height of fluid in drill pipe and between drill pipe and casing.) Recovery brought to surface 90' sulphur water with very slight rainbow, which 90' was below circ. stub., FP 90-670#, SIP 3125#, HP 3405#.

DST 7307-36, 1/2" x 1/4" chokes, no water cushion, open 42 min., closed 15 min., flowed mid and salt water after 34 min., TFP 4" choke 180#, FP 1400-3600#,

SIP 3700#, HP 4100#.

DST 73h5-5h,X0xx 3/8" x 1/h" chokes, no water cushion, straddle packer test; TD 739h; open 30 min., SI 15 min., opened with good blow, died to weak bubble after 25 min., rec. 910' mud and salt wtr., slightly gas cut, FP 0-320#, SIP 3615#, HP 3995#.

Plugged Back 58hh

DST 5830-5844, packers failed.

DST 5837-5844, 1/2" x 3/4" chokes, no water cushion, packers gave way.

Plugged Back 5827

DST 5812-27, 5/8" x 1/4" chokes, no water cushion, tool open 8 hrs. 17 min., weak blo, tool plugged, reset tool 7 times, rec 3367' fluid, 900' light mid, 2967' mid with abundance of free oil on bottom, 90' free oil, FP 50-100#, SIP 2750#, HP 3000#.

DST 5814-5827, 5/8" bottom, no top choke, tool open 45 hrs., fluid to surface in 23 hrs., flowed mud and oil at approx. 150 barrels per day for 22 hrs., FP 230-2380#, HP 3205#. Perforated 5799-5814 with 90 shots

DST 5799-5827, 1/2" x 1/8" top chokes, no water cushion, fluid to surface in 2 hrs. 47 min., production estimated at 300 BOPD with 600# top pressure, FP 1800-3100#, SIP 3100#. Perforated 5648-5680 with 4 shots per fott.

DST 5636-5689, gas to surface in 6 min., oil to surface in 38 min., TFP ½" 340#, TFP 1/8" 830#, top closed in pressure 960#, Calculated 625 BOPD on 1/4" choke, Calculated 400 BOPD on 1/8" choke, Basic Sediment 2/10 of 1%, SI 1 hr. Corrected Gravity 40.6°, FP 1100-2975#, SIP 3200#.

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servobable pred. Zones (From DST structural position, ect.

#Shows

(Drill Pipe Corrections (Made)

2364 Driller = 2367 SIM +30 2914 Driller = 2921 SIM +7

4772 Driller = 4774 SIM +21

5692 Driller = 5694 SIM +2:

Drill Sten Teate:

		Muddy Sand			6077-611,5		Canyon
	4772=4786			#LO	7307-7336	Nieku	
		Hibbey Sand Perezity	DST	#11.	7345-7354	Hisku	
DST 独	5664-5682	B-2			5830-5844		
DST #5	5814~5622	C=2	DST.	#13	5831,-5644	iii arun	
DST #6	583345880	Mission Canyon	dst	17.14	5814-5827	<u>C-S</u>	
DST #7	5918-5926	Mission Canyon	dst	#15	5814-5827	C-2	
DST #0	5939~5960	Mission Canyon	DST	#16	5799-5827	C-2	
		•	dst	#17	5648-5680	Boul & Bo	2

History Subsequent to Completion:

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COMPLETION DATA

COMPLETION DATA

CASING PROPAM: 9=21-51 1056° Fan 35 joints (998') of 13 3/8°, H-h0, 46#, R-2, 6rd thd., ST&C, Class "A" American casing. Landed 15° below R.K.B. and set at 1013'. Baker guide shoe at 1013'. Cemented with 700 sacks of regular cement. Plug down at 12:00 midnight, 9-21-51.

9-26-51 10581 Tested 13 3/6" casing with 800% for 60 minutes, held okey.

11-7-51 5819' Ren 1055.12' of N-80 and L7k5.33' of J-55 (total of 5801.45') of 7", 23", R-3, 8rd thd., ST&C, Class "A" American casing. Landed 12.30' below R.K.B. and set 5.25' off bottom at 5813.75'. Ran larkin float shee at 5813.75'; larkin float collar at 5767.34'. Ran 3 Baker centralizers spaced at 5515', 5670', and 5680'. Cemented with 200 sacks of regular cement with 2 sacks of gel added to mixing water. 3 sacks gel, 25 lbs gel flake and 50 lbs of Micatex were added through hopper. Pumped plug down with 800% maximum pressure. Bumped plug with 1000%, released pressure and float held ok. Plug down at 8:15 P.M., 11-7-51.

.11-12-51 5819' Tested 7" casing with 1150# for 30 minutes, held ok.

COMPLETION PROGRAM: 11-1-51 5819 T.D. Continued coring program from under 7" long string casing

2-20-52 9163' T.D. Reached the total depth of 9163' by almost continued coring from 5819' and ran logs.

2/21~2i/52 9163 T.D. Plugged back to 5827 prior to beginning completion as follows:

Plug No. 1: 6050 to 5850' with 38 sacks cement. Found top of cement at 5961' and cored to 5963'. Plug No. 2: 5963 to 5850' with 30 sacks cement. Found top of cement at 5969'. Plug No. 3: 5949 to 5830' with 50 sacks cement. Found top of cement at 5906'. Set Baker Model "K" retainer at 5847'. Retainer held weight and pull, but when attempted to pump in formation, circulation broke around retainer apparently thru fractures. Pulled loose. Plug No. 4: 5906 to 5830' with 20 sacks cement. Drilled from 5830 to 5844 to run DST. Plug No. 5: 5844-5822' with 20 sacks cement. Found top of cement at 5827', PBTD

Ferforated "C" Zone from 5799 to 5814 with 6 bullets per foot. Perforated the "B-1" and "B-2" Zones from 5648 to 5680 with 4 jet shots per foot. Run Baker Model "I" production packer on wire line and set at 5750. Run 2 1/2" tubing and set in packer at 5750 in order to flow the "C" Zones through the tubing and the "B-1" and "B-2" Zones co-mingled through the casing. Initial production after cleaning into burning pits was:

"B-1" and "B-2" Zones co-mingled flowed 233 BOFD with .6 of 1% BSW/ on a 10/6h" choke with a casing-flow-pressure of 525%.
"C" Zone flowed 252 BOPD with .6 of 1% BSW/ on an 8/6h" choke with a tubing-flow-pressure of 800%.
Tested for communication between zones, none indicated.

ELECTRO LOG DATA

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EAST POPLAR UNIT WELL NO. "1"

WELL LOG DATA

TYPE OF LOGS		INFERVAL LOCGED
Schlumberger Electrical S Schlumberger Electrical S Schlumberger Microlog 5 ⁿ Schlumberger Limestone Su Schlumberger Temperature	urvey 5"	66°-9127° 66°-9127° 5814°-9124° 4650°-9124° 3500°-5749°
	LCG TOPS	Depth Datum Thickness
Judith River Eegle Miobwara Greenhorn Graneros Muddy Sandstone Dekota Siltstone Morrison Swift Vanguard Rierdon Piper Limestone Gypsum Springs Spearfish Amsden Heath Otter Kibbey Sandstone Kibbey Limestone Madison A-1 A-2 A-3 A-4 B-1 B-2 B-3 B-1 B-2 B-3 B-1 B-2 B-3 B-1 B-2 S-3 B-1 B-2 S-3 B-1 B-2 B-3 B-1 B-1 B-1 B-2 B-3 B-1 B-1 B-2 B-3 B-1		5649 (~3526) 10° 5666 (~3543) 16° 5686 (~3563) 8° 5719 (~3596) 5° 5755 (~3632) 7 5789 (~3656) 7 5800 (~3677) 14° 5816 (~3693) 6570 (~4447) 7162 (~5039) 7200 (~5077) 7308 (~5185) 52° 7360 (~5237) 7780 (~5657) 8020 (~5897) 8084 (~5961)
Prairie Carbonate	الكراب فيار الما فيه في فيه الما كان و 2 والمار فيه المار عن فيه المار ا	8105 (=5982) !

Page 5

Interlake	_	_	_	-	-	-	~	-	-		_	_	-	8178 (~6055)
Gunton	-	_		-	~	-	-	-	-	••	~	_	-	8565 (-6442)
Stany Mountain		-		-	-	•••	-	~		_	-	-		8668 (-6545)
Red River	-	-	-	-	-	-	-	-	-	-	**	~	-	8695 (-6572)
Winnepag	-	-		~	-		-	-		-	-	_	-	9070 (~694 7)
Winnepog Sand	-	-	~	••	-	-	•	-	-		••	-	**	9100 (-6977)

T. D. - 9127' Schlumberger = 9127' Driller

Cores #89 through #93 were cut after logs were run. Well bottomed at 9163'

DRILL STEM TEST RECORD

EAST POPLAR UNIT WELL NO. 1

DRILL STEM TESTS RECORD

- DET #1: MUDDY SAND 2904-2921' Used Halliburton tool. Ran 1/2" bottom choke and 3/8" top choke with 500' water cushion. Tool open for 15 minutes and closed for 10 minutes. Recovered 500' water cushion and 300' brackish formation water, trace of oil and gas. IEMFP 150#, FBHFP 165#, EHSIP 1150#, Hydro 1450#.
- DST #2: AMSDEN 4772-4786' Used Halliburton's tool. Ran 3/8" bottom choke and 3/8" top choke with 500' water cushion. Tool was open 30 minutes. Had a very weak blow for 25 minutes and no blow at all for 5 minutes. Recovered 500' water cushion, 85' of brackish water, and 30' of oil and gas cut mud. NaCl 38,000 PPM. IBMFP 200#, FBMFP 200#, Hydro 2700#.
- DST #3: KIBEEY SAND POROSITY 5170-5183' Used Halliburton tool, 1/4 x 1/4" chokes. Tool open 20 minutes, closed in 10 minutes. Recovered 2240' total fluid, 40' rat hole mud, 2200' salt water, slight cut with oil and gas, (oil 38.80, salt water 43,000 PPM). IBMEP 250%, FRMEP 1100%, BHSIP none recorded, Hydro 2900%.
- DST #4: "B-2" 5664-5682' with Halliburton tool, 1/4" x 1/4" chokes, 500' water cushion. Tool open 20 minutes, fair blow, closed 8 minutes. Recovered 4185' total fluid, 500' water cushion, and 500' oil and gas cut mud. 3185' of 38.3° green oil with slight sulphur odor, (Cl 6500 PPM off tool). IBHFP 800#, FBHFP 1800#, BHSIP 2800#, Hydro 3000#.
- DST #5: "C-2" 5814-5822' Packer set in 7" casing et 5745'. Halliburton tool, 5/8" bottom choke, 961' water cusion. Opened tool at 11:10 A.M., 11-13-51, received water to surface at 11:48, mud at 12:35 and oil (400gravity) at 1:13 F.M. Flowed well on 1/8" choke at the rate of 10.26 barrels per hour with 250# maximum top flowing pressure. Closed well in for eight hours total time and had 800% top shut in pressure. Pulled tool 1cose at 6:00, 11-14-51. TEMEP 1250%, FEMEP 2435#, EMSIP 3001#, Hydro 3200#.
- DST #6: MISSION CANYON 5833-58801 5/8" bottom choke, 1/4" top choke, no water cushion. Tool open 4 hours, closed in 10 minutes for bottom hole pressure. Oas to surface 2 hours, 20 minutes; mud to surface 2 hours, 40 minutes. Top flowing pressure 8#, top closed pressure 560#. Flowed mud, oil and gas cut sulphur water. 17,000 PFM. IBHFP 50#, FEHFP 2550#, BHSIP 3000#, Hydro 3325#.
- DST #7: MISSION CANYON 5918-5926' Used Halliburton's tool. 5/8" bottom choke and 1/4" top choke, no water cushion. Opened tool at 9:55 A.M., received slight blow for two minutes. Reset tool five times and received slight blow each time. Tool open one hour and fifteen minutes total time. Recovered 640' mud with no trace of oil or gas. Closed 15 minutes for shut in pressure. IBHFP O#, FBHFP 320#, BHSIP 2905#, Hydro 3260#.
- DST #8: MISSION CANYON 11-26-51: 5939-5960' Used Halliburton test tool, 5/8" bottom choke, 1/4" top choke, no water cushion. Tool open at 8:44 A.M., received fair blow, flowed mud to surface 9:15 (31 minutes).

- DST #8: (Continued)
 Changed top choke to 1" at 10:15 A.M. Flowed sulphur water to surface 10:35 A.M. (1 hour and 15 minutes), closed in for top pressure 10:14 / to 10:59 A.M. (15 minutes). Tool closed 10:59 A.M. to 11:19 A.M. (20 minutes) for bottom hole pressure. TFP on 1/4" choke 165%, TFP on 1" choke 35%, TSIF 12%. IBHF? 2035%, FEMFP 2850%, BHSIP 305%, Hydro 3210%.
- Del #9: MISSION CANYON 6077-61651 5/8" bottom choke, 1/4" top choke, no water cushion. Tool open 3 hours, weak steady blow for 2 hours, very weak blow for 1 hour. Shear pin in circulating sub sheared while coming out of hole which would let fluid in or out of drill pipe, depending on relative heights of fluid in drill pipe and between drill pipe and casing. Recovery brought to surface was 90° of sulphur, salt water with slight reinbow which was below circulating sub; 1660 pipe dripped mud which was oil cut. Water 43,000 PPM. IEHFP 90%, FEHFP 670%, EHSIP 3125%, Hydro 3405%,
- DST #10: MISKU- 7307-7336' Packer set at 7307'. 1/2" bottom choke, 1/3" top choke, no water cushion. Test tool open 1/2 minutes, closed 15 minutes. Tool opened with good blow, flowed mud and selt water to surface 31 minutes, very little gas. Chloride test 73,000 PFM, Salt test 121,000 PFM. Top flow pressure 1/1" choke 180%. IMMFP 11:00%, FEMFP 3600%, FMSIP 3700%, Hydro 1100%.
- DSI #11: NISKU ~ 7315-7354' Packers set at 7345' and 7354' (straddle packers)
 T.D. 7394'. 3/8" bottom choke, 1/4" top choke, no water cushion.
 Teol open 30 minutes, closed 15 minutes. Opened with good blow, died to weak bubble after 25 minutes. Recovered 880' salt water, 30' rat hole mud, slightly gas cut. Chlorides 52,000 PPM, Salt 85,000 PFM.
 IEMFP 0#, FEFFF 320#, BHSIP 3615#, Hydro 3995#.
- DSP #12: 5830-58141 Packer failed. Misrum. Halliburton
- DST #13: 5834-5844 Packer failed. Misrus. Halliburton
- DST #11: "C-2" 5814-5827 with Helliburton test tool. Packer set at 5759 in 7" casing, 5/8" bottom choke, 1/4" top choke, no water coshion. Opened tool February 29, 1952; 7:38 A.M., fair blow; 7:57, weak blow; 8:05, no blow; 8:10, reset tool; 8:17, weak blow; 8:34, no blow; 6:37, reset tool; 9:45, weak blow; 10:05, no blow; 10:15, reset tool; 10:55, weak blow; 10:57, reset tool; 11:28, reset tool; 3:55 P.M., pull test tool. Recovered 3357 fluid, 900 light mud, 2457 stiff mud with abundance of free oil, bottom 90 free oil. IEMFP 350%, FEHF? 14:00%; BHSIP 2750%, Nydro 3000%.
- DST #15: "C-2" 581h-5827" with Halliburton test tool. Packer set at 5759 in 7" casing, 5/8" bottom choke, no top choke, no water quahica.

 Open tool 9:20 A.M., 3/1/52, fluid to surface in 23 hours. Flowed mud and oil at approximately 150 barrels per 2h hours for 22 hours.

 Reversed out and pulled tool 3/3/52. Chloride test of mud from too of test tool 4700 PPM. IEMEP 230%, FEHFP 2380%, Hydro 3205%.

- DST #16: "C-2" 5799-5827' Packer set at 5759', 1/2" bottom choke, no water cushion. Tool open at 6:32 P.M., 3/5/52. Fluid to surface at 9:15 P.M., oil to surface at 12:15 A.M. Had considerable plugging of bool during this interval making it necessary to open and close tool a number of times. Flowed on 1/h" choke at 150%, cut back to 1/8" choke and flowed at 600%, making close oil with slugs mud, estimated total of 15% mud, estimated 300 barrels fluid per day, no water. Tubing shut in pressure 900%, appears to be making very little gas. Reversed out 12:00 noon, 3/6/52. IBHFP 1800%, FEHFP 3100%, BHSIP 3100%, Hydro 3250%.
- DST #17: "B-1" and "B-2" 3/7/52 5648-5680' with Johnston test tool. Bottom packer set at 5689', top packer set at 5636', 1/2" bottom choke, no water cushion. Tool open at 7:57 A.M., 3/7/52 with good blow. Gas to surface 8:03 AM, fluid to surface in 36 minutes; surface flowing pressure on 1/4" choke 340%; surface flowing pressure on 1/8" choke 830%. 10 minutes surface shut in pressure 960%. Estimated 625 barrels oil per day on 1/4" choke, estimated 400 barrels oil per day on 1/8" choke. BSAN = 0.2% corrected gravity 40.6. Tool closed 1:00 F.M. to 2:00 P.M., 3/7/52. IEEFP 1100%, FEEFP 2975%, BHSIP 3200%, Eydro 3250%.

MUD PROGRAM SUMMARY

ZAST POPLAR UNIT WELL NO. "1"

MUD PROGRAM SUMMARY

Gel and Baroid were used to run electric logs for best evaluation. It would be practically impossible to compile a mud summary due to loss circulation and blowouts.

Mud weight over 10.4 lbs/gallen would start losing mud. Less than 10.4 lbs/gallen would start flowing.

DRILLING BIT AND TOTCO RECORD
AND DIAMOND CORE BIT RECORD

DRILLING BIY RECORD

New Company C

Bit No.	Nake	51:se	Туре	Ser. No.	. Fron	fo
1	Hughes	9 7/8			ō	1058
12345678	Read	17 1/2	Reamer		0	1058
3	Hughes	8 3/4	080-3	37028	1058	2142
i.	17	11	(1	17937	21/12	23.57
દું	R	23	OSC	661,80	2367	2921
6	11	11	11	64101	2921	3225
7	11	11	0SC-1	65682	3225	31.50
8ં	IS.	ti	OSC	61,022	31:50	35.56
9	i!	11	11:	64111	3556	3675
ió	11	G.	0SC3	18105	3675	ર્કે કેટો _ક
11	f:	n	OSC	4,5989	3834	3973
12):	1)	a	67050	3973	Lolia
1.3	11	ti	0SQ-2	68167	ĮįOlį2	1257
14.	11	f1	OSC-1	65675	1,267	1,376
īš	11	я.	OSQ − a	68288	1,376	1516
15 16	11	12	೧೨೦	9221	4516	6724
17	11	11	13	64015	1:714	477);
, 17	::	ii.	7.	11	4775	1.785
`I3	1)	11	Ħ	64016	1,785	1,865
19	Reed	17	2H	30442	4865	1,955
50	Hughes	15	୦୫ସୃ-2	68289	4,955	4973
21	Reed	11	20~\\\	51275	4973	5012
22	11	1!	2	1811	5012	5132
23	. Hughes	и "	୦୪ଢ଼-₂2	68291	5132	5174
214	Reed	1!	2H	30455	5174	5185
21 ₄ 25	ti.	11	2HS-1	30899	5185	521.5
2/5	Hughes	. 11	୦Ⴝଠୁ~2	68180	5216	5320
27	11	Ii	CMC	52305	5320	54,55
2වී	83	1:	11	52202	5465	5683
29	ti	::	CSC	64021	5683	5695
30	Reed	13	2H	30510	5695	5753
31	Hughes	13	OMC .	52301	5753	5810
32	ü	6 1/4	W7R	81945		
33	ii	6 1/8	OVIS	58901		
31,	11	ri .	W/R	61663	6145	6157
3द	t;	ra -	\$1	Renn	6528	6530
36	Reed	11	2 G	59012	7075	7073
35 36 36 36 36 36	n	11	. "	Rerun	7394	7073 71:00
36 36	12	11	12	;;	7394 7657	7659
36	14	13	11	13	7717	772.8
35	IJ	17	T;	R	8162	8166
37	n .	n	13	59021	8573	8875

Pege 6

<u> Hit Munber</u>	Make	Sine	Ser.#	Core #	From	To
Come Bit #1	Christensen	6 1/8	s 577	1	2357	2375
	17	17	11	2	4775	4785
	11	17	13	2 3 4	5171:	51.84
	Ħ	11 .	tr),	5184	5223
	. 10	13	ប	दे	5583	5693
	II .	11	17	5 6	5595	5752
	t)	11	17	7	5753	5800
	n	11	11	8	5810	5819
	: :1	11	11	9	5819	5829
	11	tt.	п	10	5829	5880
Core Pit #2	Christensen	11	S1079	11	5881	5899
Core Bit #3	010.7203112311	11	T789	12	5699 ·	5911 ₁
Core pro 42	11	n	# 103.	13	2017i	5926
Come Data Bo	 ti	11		114	5926	
Core Bit #2	 !r		51079 "		5936	5936 5960
	11	17	17	<u>15</u>		
anna Dan III	12	11		16	5962	5995 4000
Core Bit #4	n n	11	ฮ 1 700 "	<u>1</u> 7	5995	6009 6009
	" fi	n	:. ::	18	6009 6009	6035
a +10.1 //m		18		<u>19</u>	6035	6090
Core Bit #5	n	15	V300	20	6090	6145
	1?			21	6147	6203
Core Fit #3		π	T789	22	6203	6258
Core Bit #4	11	:I	U1700	23	6258	6314
Core Bit #3	12	11	T789	2l;	631l;	6372
Core Bit #5	11	11	v:∞2	25	6372	6 <u>1</u> 30
	12	1;	11	26	6430	6488
Core Mt#7	17	n	W=3	27	£488	6528
a	li .	n	fi	28	6530	6588
Core Bit #8	i!	11	₩~ <u>6</u> 38	29	6588	6646
		n	R	30	6646	670L
Core Bit #9	ii .	Ħ	W-755	31	6701	6763
,	11	. 11	1:	32	6763	6821
Core Bit #10	11	17	W757	33	6821	6379
	11	11	n	34	6879	6937
Core Bit #14	11	11	X2791	71	3680	8686
	11	u	ti -	72	8686	8737
	13	(3	11	73	8737	8795
	G	13	13	74	8795	881,6
Core Bit #15	tī	12	X2011	75	8846	8573
Core Bit #16	17	13	x2045	76	88 7 5	8933
Core Bit #17	ti	::	<u> </u>	?7	8933	8992
Core Bit #16	11	11	X2045	78	8992	9047
Core Bit #17	11	t !	X2118	79	9047	9055
Core Bit #11:	n	11	X2791	ao	5055	9058
Core Bit #18	11	ti.	X2040	81	9058	9061;
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Bit Number	Make	Size .	Ser.#	Core#	Fra	To
Core Bit #18 .	Christensen	6 1/8	X201:0	83	9088	9102
Core Bit #20	18	11	T263	۶ <u>۲</u>	3705	9168
Core Bit #21	r: 18	12	Y2611	85	9108	9112
Core Rit #22	15	71	¥327	ò3	9112	9120
Core Rit #20	11	t?	Y236 '	87	9120	9 <u>121</u>
Core Bit #23 Core Bit #2L	i!	 E	¥326 ₩41363	88 89	9121	91.27
Core Bit #25	n	n	7500	90 90	9127 9137	913 7 9145
Core Rit #21	. 11	Ħ	W-1363	91	3万2 3772	9153
Core Bit #26	u	17	x510	92	9153	9154
Core Bit #27	ŗ.	11	X1010	93	9151,	9153

TOTCO RECORD

Depth Out	Degrees Off
1210	1 3/lu
1520	1/2
1955	3/4
21,85	1
3223	3/l;
4040	3/l;
4712	1/2
5130	1/2
6530	3 1/4
7320	2 1/4

FUTURE POSSIBLE PRODUCING INTERVALS

EAST POPLAR UNIT WELL NO. "1"

FUTURE POSSIBLE PRODUCING INTERVALS

1. Name of formation or zone:

Greenhorn	Log depth: 2367-75	(Core No. 1)	Questi onable
Amsden	L776-77	(Core No. 2)	n n
A-1, 2, 3, 4	5482-5536	()	
B-3	5686-92	(Core No. 5)	
5-4	5719 ~ 25	(Core No. 6)	
C-1	5789-96	(Core No. 7)	

2. Discussion:

Greenhorn: Core description indicates show in greenhorn which has never been tested.

Amsden: The show described in Gore #2 has been tested and gave up 30° gas and oil out mud and 85° brackish water in 30 minute test. Recause of low water recovery and short test this could be considered a possible pay.

All four of these zones produce in wells that are structurally lower.

B-3 Zone: Here again structurally lower wells are producing considering core description, this zone should produce.

E-4 Zone: Very little is known of this zone to date but considering the core description and structural position relative to EPU #92, this zone should produce.

C-1 Zone: This zone is producing in EPU #55. In #1 well it is structure ally higher and a show is described in the core.

SAMPLE DESCRIPTION

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SAMPLE DESCRIPTIONS

- 50 Gravel with some brown, unconsolidated, fine to coarse grained sand,
- 90 250 No Samples
- 250 700 Gray shale, trace gravel.
- 700 750 Gray, slightly silty shale, slight trace gray, fine grained, tight, angular, glauconitic, sandstone.
- 753 Sample Top Judith River
- 750 770 Gray shale, some gray, fine grained, tight, angular, glauconitic, micaceous sandstone.
- 770 810 Gray shale, trace glauconitic, micaceous sandstone, trace gravel.
- 810 820 Very light gray, fine to medium grained, calcareous, glauconitic sandstone, some gray shale.
- 820 1020 Gray silty to sandy shale, trace to some, fine to medium grained, tight, glauconitic sandstone, trace gravel.
- 1020 1060 Depth Correction
- 1060 1070 Gray, silty shale, trace limy sandstone, slight trace white limes stone.
- 1070 1080 No samples.
- 1080 1100 Gray silty shele, trace to some limy sandstons, trace gravel.
- 1100 1200 No samples.
- 1200 1300 Gray, slightly silty shale, trace white, dense, sandy limestone.
- 1300 1350 No samples.
- 1350 1180 Gray, silty shale and silty sandstone, trace white, dense limestone.
- 1160 1520 Gray, glauconitic, silty, fine grained sandstone, with trace limes stone at base.
- 1520 1540 Gray, silty, shale to silty sandstone.
- 1540 1580 Gray, silty shale, trace white, dense limestone, some very light gray, fine grained, tight, glauconitic sandstone.
- 1580 1590 Gray, silty shale.
- 1590 1630 Gray shale, some white, dense, shalky limestone, trace gray, very fine grained sandstone.

Sample Descriptions Continued

- 1630 1650 Grayish-brown, dense limestone, some gray, very fine to fine grained, tight sandstone.
- 1650 1820 Cray shale, trace white, dense, chalky limestone.
- 1820 1830 Gray shale, trace white, dense, chalky limestone, trace chert.
- 1830 1850 Gray shale, some bright red iron stained shale, trace limestone.
- 1850 1860 Gray shale, some white, dense, chalky limestone.
- 1860 1910 Gray shale, trace white, dense, chalky limestone, trace gray, very fine grained, tight, silty sandstone, trace chert.
- 1910 1920 Gray shale, abundant chert.
- 1920 1950 Gray shale, some white and brown, dense limestone, some chert.
- 1950 2000 Gray shale, trace to some white, dense, chalky limestone, trace to some chert.

2005 Sample Top Niobrara

- 2000 2030 Dull brownish-gray, silty shale, trace light gray, glauconitic sandstone, trace limestone.
- 2030 2010 Gray shale, trace, white, dense, limestone.
- 20h0 2070 Gray, silty to sandy shale, slight trace white, dense limestone.
- 2070 2150 Gray, silty to sandy shale, some gravel, slight trace, white, dense, limestone.

2155 Sample Top Carlisle

- 2150 2130 Gray, silty, sandy shale, trace very fine grained sandatone, trace pyrite.
- 2180 2200 Gray, silty to sandy shale, some very fine grained sandstone, trace grayel.
- 2200 2240 Gray, silty to sandy, micaceous shale, some gray, very fine grained sandstone, some gravel.
- 2240 2270 Gray, silty to sandy, micaceous shale.
- 2270 2300 Gray, silty to sandy, micaceous shale, trace white, dense limestone.
- 2300 2350 Gray, silty to sandy, micaceous shale.

2350 Sample Top Greenhorn

- 2350 2367 Brown, dense limestone, some fine crystalline limestone, some dark brownish-gray calcareous shale.
- 2367 2375 Core No. 1, cut 8' recovered 8'.

Sample Descriptions Continued

- 2375 2400 Speckled white on brown, dense, mealy limestone, trace gray shale.
- 2h00 2h10 Dark gray, calcareous shale, some dark brown, dense, argillaceous, limestone.
- 2410 2420 Dark gray, calcareous, slightly micaceous shale.
- 2420 2440 Dark (ray, calcareous, slightly micaceous shale, trace dark brown argillaceous limestone.
- 2000 2000 Dark gray, calcareous, slightly micacaous shale, trace very fine grained, argillaceous sandstone.
- 2150 2500 Very dark gray, micaceous shale, streaks white bentonite.
- 2500 2540 Very dark gray, micaceous shale, trace brown limestone, trace bentonite.

2542 Sample Top Graneros

- 2540 2570 Very dark gray, micaceous shale.
- 2570 2620 Very dark gray, micaceous shale, trace sandy shale, slight trace sandstone, slightly pyritic.
- 2820 2830 Speck green on brown, fine grained, tight sandstone and gray micaceous shale.
- 2830 2900 Dark gray, micaceous shale, some sandy shale, some fine (rained, tight sandstone.

2900 Sample Top Middy Sandstone

- 2900 2920 Very light gray, very fine grained, angular, porous sandstone.
- 2920 2940 Very light gray, very fine to fine grained, angular, very slightly porous sandstone and dark gray shale.

2946 Sample Top Skull Creek

- 2940 3010 Dark gray micaceous shale, trace silty sandstone.
- 3010 3045 Cray shale, trace gray silt.
- 3045 3050 Redish brown shale and sandy silt.
- 3050 3055 Gray shale, some redish-brown shale and very fine graind, tight sandstone.
- 3055 3060 Gray shale, trace gray siltstone.
- 3060 3065 Gray shale, trace gray siltstone, trace redish-brown, very fine grained, silty sandstone.
- 3065 3070 Redish-brown shale and very fine grained, tight sandstone, some gray splintery shale.

dense limestone.

Gray-brown, very fine grained, hard and tight sandstone, some gray splintery shale. 3095 3100 Gray splintery shale, some gray, very fine grained sandstone. Brownish red, very fine grained, tight silty sandstone and black, carbonaceous shale. 3105 3110 Gray, slightly micaceous shale. 3112 Sample Top Dakota Siltstone Gray splintery shale and light gray, very fine grained, tight, sandstone and silt. 3130 3145 Gray, silty, micaceous shale. 31772 3175 Very light gray, silt and very fine grained sandstone, some 31.75 3215 White, very fine grained, porous sandstone, some gray splintery shale. 3215 Red to redish-brown, fine grained, slightly porcus sandstone, trace brown shale, some gray shale. 3240 Gray splintery shale, some white, fine to medium grained, slightly porous sandstone. 3240 3275 White, fine grained, porous, micaceous sandstone, some gray splintery shale, 3275 Gray to dark gray shale and white fine to medium grained, slightly porous sandstone. 3320 Dark gray splintery shale, slight trace sandstone. 3315 3320 3325 Dark gray splintery shale, trace red shale, slight trace sandstone. 3325 3385 Dark gray splintery shale, slight trace sandstone. 3385 Park gray to black, micaceous, fissile, shale, trace to some red, fine to coarse grained, tight, porous, sandstone. 3390 3400 Dark gray to black, micacecus, fissile, shale. 31:00 Dark gray to black, micaceous, fissile shale, trace to some, medium to coarse grained, porces sandstone. 3/1/10 Dark gray to black, fissile, micaceous shale, slight trace, white

3450 3550 Dark gray to black, fissile, micaceous shale, some white, fine to medium grained, porous, angular, micaceous sandstone.

Samole	Descriptions	Continued
	70201 TD 01010	CONTINUE

Samoj	e Desc	riptions Continued
<u>3567</u>		Sample Top Swift
3550	3615	Very light gray to tan, slightly calcareous, glauconitic, fire- grained sandstone and gray splintery, micaceous shale.
3615	3 630	Gray to brown, silt and silty sandstone and gray shale.
3630	3635	Gray micaceous splintery to fissile, shale, some brown crystalline limestone.
3635	3655	Gray, smooth, slightly micaceous shale, some tan, very fine grained, tight, micaceous, glauconitic, calcareous sandstone.
3655	3670	Very light tan, fine grained, sub-angular, porous, slightly calcareous, glauconitic sandstone and gray shale.
3670	3680	Gray, smooth, slightly micaceous shale.
3680	3715	Very dark gray, smooth shale, trace white, very fine grained, glau- conitic sandstone.
3715	3720	White to light tan, very fine to fine grained, slightly porous, glauconitic sandstone.
3720	3750	Dark gray, smooth, slightly micaceous shale, slight trace white, glauconitic sandstone.
3750	3900	Dark gray, smooth, slightly micaceous shale, streaks light brown micaceous shale, occasional streaks brown siltstone and silty sandstone.
<u> 3897</u>		Sample Top Vanguard
3900	3950	White to light tan, very fine grained, tight to porous calcureous, glamconitic sandstone and dark gray smooth shale, trace brown shale.
3950	7002	Gray-greenish and brown shale, trace to some white calcareous sandstone and siltstone.
F002	4060	Gray to greenish gray waxy, splintery shale.
7060	4080	Gray to greenish gray waxy, splintery shale, slight trace silty sandstone.
1,075		Sample Top Rierdon
Ų080	1090	Gray to greenish gray, waxy, splintery shale, slight trace tan, very fine grained succhro limestone.
F080	F130	Greenish gray waxy shale, trace brown, very fine grained, succhro, tight limestone and limey sandstone.

hllo hlho Greenish gray, маху shale, trace gray to ten, silty, calcarecus sardstone.

- 4140 4245 Greenish gray, waxy shale, occasional thin streaks tight, silty sandstone.
- 4245 Sample Top Piper Shale
- 4245 4280 Greenish gray, waxy shale, trace to some red silt and shale, few pieces white gypsum.
- 4280 4335 Greenish gray, waxy shale, trace silt and silty sandstone.
- 4330 Sample Top Piper Limestone
- 4335 4380 Tan to brown, hard, dense limestone.
- 1,387 Sample Top Cypsum Springs
- 1380 14175 Greenish gray, splintery shale, trace red shale, trace white anhydrite, occasional very thin streaks limestone.
- 1475 4535 Ten to gray, microcrystalline, dense limestone and greenish gray shale, trace to some red shale, occasional streaks white annydrite.
- 4535 4580 Greenish gray, splintery shale, some red shale, some white anhydrite.
- 4578 Sample Top Spearfish
- 4580 4700 Greenish gray shale, some red siltstone, very fine grained sendstone, some red shale.
- 4700 Sample Top Amsden
- 4700 4715 Gray splintery shale, trace red shale, slight trace pink dolomite.
- 4715 4715 Pink to purple, crystalline dolomite, some greenish gray shale, some purple dolomitic shale.
- 4745 4755 Creenish gray shale, some purple dolomitic shale, trace ten, derse, limestone,
- 1755 1776 Tan, dense, fossiliferous limestone, some purple and greenish gray shale.
- 4776 4786 Core No. 2, cut 10', recovered 8'.
- 4786 4795 Purple dolomitic shale and greenish gray shale, some tan, dense limestore.
- 4795 4810 Tan, dense, microcrystalline limestone, some greenish gray and purple shale.
- 4832 Sample Top Heath
- 4810 4830 Purple dolomitic shale, some greenish gray shale, trace limestone.

Sample Descriptions Continued

- 4830 4850 Tan, dense, amorphous, very fossiliferous limestone, some purple dolomitic shale.
- 4850 4870 Redish brown to purple dolomitic shale, trace tam, dense limestone.
- 1,870 4,900 Greenish gray, purple, and redish brown shale, trace ankerites.
- 4900 4935 Redish brown shale, some purple and light gray variegated dolomitic shale, trace white sandstone.
- 4915 4925 Redish brown shale, some purple and light gray variegated delemitic shale, trace ankerites, tred red, fine grained, tight sandstone.
- 4925 1995 Redish brown, purple, light gray, variegated shale, trace to some white to pink sandstone, trace ankerites.

4994 Sample Top Otter

- 1995 5060 Brick red shale and purple dolomitic shale, trace to some very light gray, dense, amorphous to microcrystalline limestone, trace ankerites. Some greenish gray shale.
- 5060 5080 Brick red shale, some purple and gray variegated dolomitic shale, slight trace white anhydrite, some greenish gray shale.
- 5080 5090 No samples.
- 5090 5130 Brick red shale, trace purple dolomitic shale, trace green and black shale, occasional trace white enhydrite.

5130 Sample Top Kibbey Sandstone

- 5130 5150 Brick red shale, some greenish gray and green shale, some light red, very fine grained, tight sandstore.
- 5150 5155 Purple dolomitic shale, some brick red shale, trace dense limestone, some white, tight sandstone.
- 5155 5165 Greenish gray, splintery shale, trace fine grained porous sandstone with some oil stain.
- 5165 5173 Greenish gray shale, some brick red and purple shale, trace red sandstone with some oil stain.
- 5173 5183 Core No. 3, cut 10' recovered 10'.
- 5183 5184 Drilled one foot.
- 5184 5223 Core No. 4, cut 391, recovered 391.
- 5223 5270 Hight red, fine to coarse grained, porous, poorly assemted subrounded, slightly calcareous, slightly selenitic sandstone.
- 5270 5280 Red, calcareous, silty to very fine grained sandstone, trace very light gray limestone.

Sama	a Dacc	riptions Continued
5287		Sample Top Kibbey Limestone
5280	5290	Very light gray, dense, amorphous limestone, trace white anhydrite.
5290	5295	White anhydrite, trace limestone, trace red, silty to very fine grained, sandstone.
5295	5300	White to light gray, very fine grained, tight, calcareous sandstone, trace limestone, trace anhydrite.
5300	5330	light gray, very fine to fine grained, some red, purple and yellow, shale, trace greenish gray shale.
5330	5350	Red, very fine grained, tight sandstone, some red and purple shale trace greenish gray shale.
5350	5375	Purple and dark rad shale, trace to some red and brown, very fine grained, tight sandstone, trace to some greenish gray shale.
5375	5390	Light red silt and very fine grained sandstone, trace purple and red shale, some greenish gray shale.
5390	5410	Light red, silty to very fine grained, tight, calcareous sandstone, trace to some red shale, some greenish gray shale, trace white anhydrite.
<u>5395</u> .		Sample Top Madison
5410	5430	Some white anhydrite, some red and purple shale, some greenish gray shale, some red to tan sandstone.
5430	5460	White, anhydrite, some greenish gray and redish brown shale.
5460	5465	Gray, very fine crystalline, tight, limestone, some dark red and gray shale.
5465	5480	White anhydrite, trace to some brown, dense limestone, trace red shale.
<u>5482</u>		Sample Top A-1 Zone

- 5480 5510 White to tan, colitic, amorphous tight limestone, some anhydrits, trace red shale.
- 5510 5520 White anhydrite, some fine crystalline limestone, trace gray shale.
- 5520 5525 No samples.
- Very dark brown, dense, amorphous limestone, trace to some white anhydrite, trace red shale.
- 5560 5580 No samples.

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5580	5590	White anhydrite, some dark brown, dense limestone, some dark red and gray shale.
5590	5600	Very dark brown to tan, dense, limestone, trace to some white anhydrite, trace to some dark red and gray shale.
5600	5615	White anhydrite, some light gray dolomite, some dark brown, dense, limestone.
5615	5625	White anhydrite, trace dark red and gray shale.
5625	5640	White anhycrite, trace limestone, some treemish gray, very dark red shale.
5640	56115	Dark gray-greenish gray shale, some white anhydrite.
5649		Sample Top B-1 Zone
5645	5655	Some tan, silty limestone, some white anhydrite, some red and gray shale.
5655	5665	White anhydrite, trace to some brown, dense limestone, trace to some dark red and gray shale.
<u>5665</u>		Sample Top B-2 Zone
5665	5680	Dark brown, dense, amorphous limestone, trace white anhydrite.
		Cored continuously from 5682 to 9163 except for few short intervals which were drilled.

CORE DESCRIPTION

1.00 A

Greenhorn 2367 - 2375, recovered 81 Core No. 1 C.T. - 23, 20, 12, 12, 11, 14, 22, 32

11013 Limestone: speckled white on brown and brownish gray. mealy to finely crystalline, hard and tight, becoming shaley in numerous irregular very thin streaks, numerous thin prismatic layers calcite throughout, and to an thick vertical calcite vain running length of core, very fossiliferous (Inoc.), bright golden fluorescence about 1 from base of core in shale streak, probable mineral fluorescence, core yielded small (21) methane reading throughout.

Core No. 2 Amsden 4776 - 1786, recovered 81 C.T. - 10, 9, 16, 45, 12, 18, 12, 12, 12, 12

- 7 1 O !! Timestone: ten, micro-crystalline, danse, with fairly numerous anhydrite crystel masses and individual crystals scattered throughout, fair amount very small vugular porosity; highly fractured vertically, few streaks and spots bright golden fluorescence on fracture planes, few spots questionable brown oil stain, no odor, no taste, slight C Cly cut.
 - 211 Lirestone: tan, massive, dense, hard and tight, numerous very thin light purple very calcareous shale streaks, slight sulphur odor on fresh break, no show.
 - Limestone: tan, locally light purple, massive to microcrystalline, dense, crystals of anhydrite scattered throughout, few thin streaks light ourole calcareous shale, few black stylolitic partings, hard and tight, slight sulphur odor on fresh break, no show.
- 3.100 Limestone: tam, micro-crystalline, dense, numerous anhydrite crystals and crystal massed, hard and tight, highly fractured vertically, slight sulphur odor on fresh break, numerous ostracod molds filled with calcite, no show.
 - 10" Limestone: tan-brown, becoming purple and argillaceous in streaks, massive to micro-crystalline, dense, anhydrite crystals scattered throughout, occasional black stylolitic partings, hard and tight, few estraced molds filled with crystalline anhydrite, slight sulphur odor on frash break, no show.
- 1.1211 Limestone: light tan, micro-crystalline, dense, moderate amount irregular crystalline masses and individual caystals anhydrite scattered throughout, very crude oblitic structure present in few areas, hard and tight, ostracod

molds filled with crystals anhydrite scattered throughout becoming very numerous toward base, single vertical fracture running length of unit, slight sulphur odor on fresh break, no show.

Core No. 3 Micboy Sand 5174 - 5184, recovered 109 C.T. - 7, 3, 5, 7, 6, 6, 6, 5, 6, 5,

- 2:3" Sand: brown, becoming light red in spots and streaks, fine to coarse grain, scattered green grains, sub-rouned, very porous and permeable, even light brown oil stain except in few red areas, good oil and gas tasted, even dull yellow fluorescence except in few red areas, good COll cut.
- 1º0" Sand: red with scattered green grains, fine to coarse grain, sub-rounded, poorly assorted, tight to slight porosity, no show.
- 1'0" Sand: red, scattered dark grains, medium to coarse grain, sub-rounded, poorly assorted, very well cemented, hard and tight, no show.
- 212" Sand: red, scattered dark grains, fine grain, sub-engular, micaceous, fairly well cemented, very slight porosity, no permeability, looks wet, no show.
 - 2" Send: light gray, fine grain, angular, fairly well cemented, few shale partings, tight, looks web, no show.
- 240" Sand: same as above 212" except being very fine grain.
- 1°5° Send: red, with scattered dark grains, very fine grain, becoming siltstone in streaks, fairly well camented, micaceous, no show.

Core No. 4 Kibbey Sand 5184 - 5223, recovered 391

- C.T. 23, 10, 7, 5, 5, 9, 3, 4, 5, 6, 4, 4, 6, 6, 6, 8, 8, 10, 6, 4, 5, 7, 5, 5, 7, 7, 7, 11, 8, 7, 7, 7, 6, 8, 12, 12, 6, 6, 17, 17
- 1909 Shale: red, slight variegated with gray, slightly silty.
 - 9" Sand: red, fine to coarse grained, poorly sorted, slight porosity and permeability, slightly calcareous and micacceous, looks wet, no show.
 - 3" Sand: light ourole, fine grain, tight, no show.
- 616" Sand: red, fine to coarse grained with scattered green grains, poorly sorted, porosity and permeability, calcareous, no show.
 - 9" Sand: red, scattered green grains fine to coarse grained; very hard and tight, well cemented, calcareous, no show.
- 1'9" Sand: bright red, scattered green grains, fine to coarse grained, slight porosity and permeability, coorly cemented, slightly calcareous, no show.
- 310" Send: light red, coarse grained, with few medium grains sand, hard and tight, appears to be cemented with selenite, no show.
- 1'2" Shale: bright red, silty, micaceous.
- 310" Silt to very fine grained sand, hard and tight, no show.

2 12 21 25 2

190" Sand: light red, medium to coarse grained, poorly cemmented, hard and tight, appears well cemented with selection, no show.

510" Sand: red, medium grained, becoming fine grained toward base, tight to questionably very slight porosity and permeability, some selenite cementing, no show.

340" Sand: red, very fine grained, silty, very hard and tight, trace of selenite dementing, no show.

10" Shale: red, with some gray variegating.

2:9" Send: red, with some varicolored grains, fine to coarse grained, boorly sorted, very slightly calcareous, well cemented with selenite, very hard and tight, no show.

, 219" Silt: red, hard and tight, no show.

293" Shale: red.

3°3" Sand: red, some varicolored grains, medium to coarse grained, poorly sorted, slightly porcus and nemmeable, selenite camented with slight sulphur odor, no show. Vertical fracture from 5212'6"-17'0".

Core No. 5 "B-3" 5682 - 5692, recovered 10' C.T. - 12, 3, 4, 4, 12, 9, 11, 14, 8, 10

- Olomitic Limestone: brown micro-crystalline, tight to questionably slightly porous and permeable, numerous very thin tight fracture planes having oil stain and bright golden fluorescence. Few prominent vertical fractures having crystalline anhydrite filling with some brown oil stain and bright golden fluorescence. Good oil odor, poer oil taste. Mass of core hard and tight with no apparant saturation. I black stylolite noted.
- 2:1" Dolomite: dark gray to dark brown. Amorohus hard and tight, no show.
- 1'll" Dolomitic Smd: light gray, fine to medium grained, subangular to sub-rounded, hard and tight, no show.

Side Wall Cores

5536 - 5554 micro-log showed good permeability
Sidewall core at 5552 - Limestone: very dark brown, hard, danse,
micro-crystalline, greasy luster, fair oil odor, spotted
light gold fluorescence.

5649 - 5657 micro-log showed good permeability
Sidewall core at 55549 - "B-1" - Limestone: tan-brown, firm,
micro-crystalline, questionable slightly porous and
permeable, even greasy luster, good oil oder, even dull
golden fluorescence.

Sidewall core at 5655' - "B-l" - Limestone: dark brown, firm, hard, micro-crystalline, dense, trace greasy luster, no odor, few spots bright golden fluorescence.

Sidewall core at 1916' - Heath - Limestone: dark brown, hard, dense, micro-crystalline, no show.

	5667 -	5680 micro-log showed good permeability	
	5685 5686 5687 5688	1.37 0 38 72 0 0 0 0	
Gore No. 6	5595 a	5752 26, 26, 25, 24, 25, 21, 24, 19, 19, 25, 20, 15, 16, 16, 13, 10, 12, 13, 22, 5, 6, 8, 15, 9, 16, 12, 20, 13, 18, 16, 16, 15, 8, 14, 17, 17, 15, 14, 14, 12, 11, 17, 17, 14, 29, 24, 21, 23, 19, 14, 24, 19, 19, 22, 24	
	8100	Dolomite: dark gray, massive, dense with scattered white	
572 1	610 ¹¹	massive anhydrite inclusions. Anhydrite: white to light brown to light gray, massive,	
	610"	dense.	
Ç		"Beld" - Limestone: very dark brown, finely crystalline with numerous crystals anhydrite scattered throughout, some fair even greasy luster with fair oil odor and bright spotted golden fluorescence	
	216"	Dolomite: gray, massive dense, earthy texture.	
	730:1	Same as above with anhydrite inclusions.	
	216"	Dolomite: dark gray massive, dense.	
	316"	Anhydrite: light brown, micro-crystalline, dense with numerous thin streaks brown shale.	
	1:07	Dolomite: very dark gray, massive to micro-crystalline.	
	د.0 بثا	Alternating dark gray dolomite and white anhydrite, mass- ive to micro-crystalline, dense.	
	Tr 3 O:1	Anhydrite: white to light brown, massive to micro-crystal	li.ne .
	•	dense, with few streaks and spots dark gray delomite.	- 3
•	6"	Dolomite: dark brown, massive, dense.	
	1:31:	Alternating dark gray dolomite, anhydrite, massive to micr crystalline, dense.	් රිප
	31611	Dolomite: dark brown, massive, dense, fairly numerous	
	510"	inclusions white anhydrite. Dolomite: derk brown, massive, dense.	•
	510a	Dolomite: dark brown, massive, dense, with few numerous	
	2-0	veins light brown, finely crystalline anhydrite.	
	29611	Limestone: brown, finely crystalline, hard and tight,	
Cora No. 7		5800, recovered 47' 18, 21, 20, 17, 19, 18, 13, 19, 19, 13, 15, 20, 18, 18, 13, 18, 15, 16, 13, 17, 23, 14, 19, 15, 24, 17, 14, 15, 15, 21, 24, 17, 14, 18, 13, 15, 17, 15, 21, 18, 19, 17, 14, 10, 13, 12, 10	

- 216" "B-5" Limestone: dark brown, dense, micro-crystalline, very thin streaks brown anhydrite toward base, no show.
- 316" "P-5" Limestone and Anhydrite: dark brown, microcrystalline, massive anhydrite, white to light gray amorphous, no show.
- l'ó" Limestone: dark gray to brown, dense, micro-crystalline, with few very small brown pellets scattered throughout,
- 1'6" Same as above 3'6".
- 1'0" Limestone: dark gray to trown, micro-crystalline, dense, no show.
- 110" Same as above 3'6".
- 1'6" Limestone: dark gray to brown, micro-crystalline, dense,
- 3:0" Limestone: dark gray to dark brown, very finely crystalline, dense, numerous dense streaks and inclusions white to brown anhydrite.
- 110" Limestone: dark gray to dark brown micro-crystalline, danse, no show.
- 1400 Dolomite: gray micro-crystalline, dense, no show.
- 1.5" Limestone: dark brown, very finely crystalline, dense, no show.
- 1980 Dolomite: dark gray, micro-crystalline, dense, no show.
- 116" Anhydrite: gray to brown amorphous, dense, becoming dolomitic in streaks.
- 5th" Dolomite: dark gray, micro-crystalline, dense with occasional streaks brown dense limestone and gray to brown anhydrite, no show.
- 3'6" "C-1" Limestone: derk gray to dark brown, massive, becoming very finely crystalline in streaks, dense, no show.
- 3.6" "C-1" limestone: dark gray to dark brown, finely crystalline to micro, dense, slight sulphur odor with numerous dark brown crystals anhydrite scattered throughout, no show.
- 210" Dolonite: dark gray, dense, micro, no show.
- 110" limestone: dark brown, massive to micro-crystalline; few streaks dark gray anhydrite, dense, no show.
- 310" Dolomite: very dark gray, massive, dense, with few thin pyritic zones, limy in thin streaks, no show.
 - 6" Shale: black fissile.
- 1'2" Dolonite: dark gray to black, massive, dense, becoming argillaceous in streaks, no show.
- 3'10" Dolomite and Limestone: dark brown, micro, dense, fairly numerous vertical fractures, oil stain on fracture planes. Good oil odor, fair taste, fairly numerous light bright golden fluorescence.
- 1'0" "C-2" Limestone: brown, micro-crystalline, dense with vertical fracture running through unit. Gil stain on fracture plane, good oil odor, fair taste, bright golden fluorescence on fracture planes.

Core No. 8 5810 - 5818, recovered 8'

8:0" Limestone: dark gray to black, very fine to finely crystalline, very hard questionably slightly porous, no permeability, good oil odor, spotted stain and fluorescence on fresh break. Entire core fractured throughout with free oil in fracture planes, even stain and bright gold fluorescence on fracture planes, slightly fossiliferous.

Core No. 9 5822 - 5830, recovered 8: ± C.T. = 3h, 32, 3h, 38, 110, 145, 160, 230

8:0" Limestone: very dark brownish-gray to black, very finely crystalline, dense, very hard, large (\frac{1}{4}" to \frac{1}{2}") brown calcite crystals scattered throughout, few black stylolitic partings, core extremely fractured throughout, with gyosum and dolomite crystals covering most of fracture planes, scattered spots brown oil stain, fair to good oil cdor, no taste, spots of bright light golden fluorescence all stain on fracture planes, no show in mass of core.

Core No. 10 5330 - 5880, recovered 491

- 1'0" Fine brown to black, finely crystalline to dense limestone, fractured throughout. Gypsum and dolomite crystals on fracture plane, some stain, slight odor, light golden fluorescence.
- 12:0" Timestone: brown to black, finely crystalline to dense, numerous amounts brown calcite inclusions, slight incipient fracturing, sulphur odor on fresh break.
- 100" Timestone: brown to black, very fine crystalline with numerous calcite filled vertical worm boring, slight incipient fracture.
- 11:6" Limestone: brown to black, micro-crystalline to very finely crystalline dense calcitic, fair amount incident fractures, stylolitic partings, slight oil odor, spotted fluorescence, fossiliferous.
- 116" Shale: black, calcareous with few pyritic brach, casts.
- 8:0" Limestone: very dark gray to black micro-crystalline, dense, fractured throughout, shaley in streaks, slight oil odor, snotted fluorescence on fracture planes.
- 10°C° Limestone: very dark brown to gray, finely crystalline to dense calcitic with few incipient fractures, stylolitic partings, sulphur odor, fossiliferous, no show.
- 1:10" Limestone: brown to black, finely crystalline to dense, very calcitic, highly fractured throughout, sulphur edor, no show.
- Core No. 11 5881 5899½, recovered 18:6" C.T. - 26, 17, 20, 16, 18, 14, 16, 18, 17, 23, 18, 16, 16, 17, 21, 18, 12, 37, 44
 - 476" Limestone: very dark brownish black, very finely crystalline, with scattered coarse crystals calcite, few round masses brown calcite believed to be replaced oblites, very fossiliferous, dense; fractured vertically, pronounced horizontal fractures due possibly to gilsonitic partings, no show.

140" Himestone: very dark brownish-black, very finely crystalline, numerous medium to very coarse inclusions and poorly formed crystals brown calcite, dense, horizontal fractures, fossiliferous, no show.

Limestone: very dark brownish-black, very finely crystalline to crypto-crystalline, few brown coarse calcite
crystalline, few round masses brown calcite, nodular,
vertical fracture throughout unit, fracture planes covered
with white calcite crystals, few globules brown oil noted,
fair heavy oil oder, spotted to even light golden fluorescence all show on fracture planes.

Limestone: very dark brownish-black, very finely crystalline, numerous small inclusions and very coarse crystals brown calcite scattered throughout, very few short vertical fractures, no show.

1900 Limestone: very dark brownish-black, medium colitic, with very fine crystalline cament matrix, colites poorly formed and mostly replaced by brown calcite, dense to questionably very slight porosity and permeability, fair oil oder, slight salt taste, slight greasy lustre, few bubbling pinpoints water, where light golden fluorescence, fossiliferous.

300 Limestone: very dark brownish-black, very finely crystalline, numerous small rounded masses and coarse crystals brown calcite scattered throughout, dense, fossiliferous, no show.

1'6" Limestone: same as above 3' but being very highly fractured and broken with white calcute on fracture planes, slight greasy lustre, no cdor, sootted light golden fluorescence, all show on fracture planes.

Core No. 12 5900 - 5915, recovered 15' C.T. - 13, 12, 11, 25, 17, 16, 14, 17, 15, 15, 16, 14, 30, 45

1110" Limestone: very dark brownish-black, micro-crystalline to finely crystalline, numerous phenocrysts brown calcite, numerous irregular rounded masses brown calcite, slight sulphur odor on fresh break, slight incipient fracture, fossiliferous, no show.

2:6" Limestone: light brown, medium to coarsely crystalline, dense to very slightly porous and permeable, slight psudo oblitic appearance. Looks wet, sulphur odor, slight fracture, no show.

Core No. 13 5915 = 5926, recovered $10\frac{1}{2}$

limestone: very dark brownish-black, very finely crystalline with numerous phenocrysts and rounded masses brown calcite, psudo colitic appearance, single vertical fracture, fossiliferous, no show.

210" limestone: very dark brownish-black, finely to coarsely crystalline, numerous phenocrysts and rounded masses brown calcite, psudo oclitic, dense, fossiliferous, no show.

- 306" Limestone: very dark brownish-black, finely crystalline, numerous phenocrysts and irregular masses brown calcite, slightly psudo oclitic, highly fractured, calcite on fracture planes, fair oil odor, no taste, fairly even bright yellow fluorescence, fossiliferous, all show on fracture planes
- 316" Limestone: same as above 316" except fluorescence is very weak, dull and spotted, odor faint, questionable wet look.

Core No. 14 5926 - 5936, recovered 10' C.T. - 17, 20, 25, 25, 26, 33, 24, 30, 60, 59

- 610" Limestone: very dark brownish-black, very fine to finely crystalline, numerous phenocrysts irregular brown masses brown calcite, dense, fractured throughout, light oil cdor, pinpoint yellow fluorescence on fracture planes, sulphur odor on fresh break, 2" streak in middle unit having numerous small irregular cylinders white calcite, fossiliferous.
- 210" Limestone: very dark brownish-black, very fine to finely crystelline with occasional thin streaks medium crystalline, dense, numerous phenocrysts and irregular rounded masses brown calcite, strong sulphur odor on break, slight fossiliferous, no show.
- 210" Limestone: light brown, medium to coarse crystalline, dense, slight pseudo colitic appearance, numerous very thin black shale stringers, strong sulphur cdor on break, no show.

Core No. 15 5936 - 5960, recovered 24" C.T. - 25, 25, 25, 17, 23, 19, 21, 32, 19, 33, 42, 21, 19, 13, 14, 14, 16, 17, 11

- 3:0" Ilmestone: very dark brownish-black, very fine to finely crystalline, scattered phenocrysts and irregular rounded masses brown calcarous, no show.
- Jiou limestone: very dark brownish-black, micro-crystalline with streak coarse crystalline dense, single fracture through middle, fracture plane covered with coarse calcite crystalline, medium porosity, fair oil odor and taste, slightly brown oil stain, bright spotted light golden fluorescence, slight sulchur odor on break, fossiliferous, all show on fracture plane.
 - (Note: lost 1 pit (400 bbls.) mud on first 93 lost 1 pit (400 bbls.) mud on next 31
- 6'0" Limestone: very dark brownish black, very finely crystalline, numerous streaks and inclusions, coarse crystalline dense, fracture, strong sulphur odor on break, fossiliferous, no show.
- 346" Limestone: as above 64 except no fracture.
- 1.6" Limestone: very dark brownish-black, very finely crystalline, scattered phenocrysts and irregular rounded masses brown calcite, dense, single vertical fracture with calcite crystalline on fracture plane, brown, oil

stain, fair oil odor and taste, bright, light golden fluor-escence, all show on fracture.

510" limestone: dark brownish-black, finely crystalline, numerous phenocrysts and irregular rounded masses brown calcite, dense, fracture, no show.

Core No. 16 5962 - 5995, recovered 30:

- C.T. 9, 13, 10, 21, 13, 15, 13, 22, 15, 16, 18, 14, 11, 17, 17, 16, 14, 24, 21, 15, 18, 23, 20, 21, 23, 56, 60, 60, 67, 38, 43, 67, 18
- hió" limestone: dark brown, finely crystalline to cryoto crystalline, dense, numerous streaks black micro-crystalline, dense, argillaceous limestone, l' slightly incipient fracture 2½ from top unit, slight oil eder, light pin point yellow fluorescence, all show on fracture plane, very fossiliferous.
- 714" limestone: very dark brownish-black, very finely crystalline, dense, fossiliferous, no show.
- 3'6" limestone: brown, medium crystalline to coarsely crypto crystalline, dense, single vertical fracture throughout unit. Fracture covered with small white calcite crystals, fair oil cdor and taste; sootted light brown stain, spotted light golden fluorescence, fracture appears to have in 1/32" separation, fossiliferous.
- 516" Limestone: very dark brown, micro-crystalline, dense, fossiliferous, no show.
- 1'2" Limestone: very dark brownish-black, massive, dense, argillaceous, no show.
- 5:0" Limestone: dark brown, massive to micro-crystalline, becoming coarsely crypto-crystalline in cottom 1:, dense, trace incipient fracture, very fossiliferous, no show.

Core No. 17 5995 - 6009, recovered 14: C.T. - 11, 13, 15, 14, 6, 8, 8, 8, 10, 7, 9, 7, 7, 29

- 14.0" Limestone: dark brown, very fine to coarsely crystalling cocasionally crypto-crystalline, dense, few scattered stylolitic particles, extremely fractured 5998-99, 6003-06, 6008-09, strong sulphur odor on fresh break, foscilliferous, no show.
- Core No. 18 6009 = 6034, recovered 25'

 U.T. = 32, 18, 19, 11, 19, 13, 8, 6, 10, 13, 8, 12, 20, 23, 20, 16, 20, 20, 20, 20, 28, 14, 17, 18, 27
 - 610" Limestone: dark brown, fine to coarsely crystalline with phenocrysts and irregular rounded massive brown calcite, dense, fractured from 6009-12, 6011-15, calcite crystals on fracture planes, sulphur odor on fresh break, fossiliferous, (spirifer), no show.

- 210" Limestone: dark brown, coarsely crystalline, very slightly porous, slightly permeable with very dark brown silt matrix which appears to be oil stain, slight sulphur oil odor, very weak spotted yellow fluorescence.
- 1'0" Limestone: brown, medium to coarsely crystalline, danss, with few large inclusions dark gray chert, sulphur olor, no show.
- 140" Limestone: as above 21 unit.
- 15'0" Limestone: very dark brown, micro-crystalline to finely crystalline, dense, some milky quartz noted at 6027', core fractured from 6024-34, fossiliferous, no show.

Core No. 19 6034 - 6090, recovered 561

- 1310" Limestone: very dark brownish-black, micro to finely crystalline; occasional dense streaks medium to coarse crystalline, dense, sulphur odor on fresh break, slight amount fracture, very slightly pyritic, fossiliferous, no show.
- 316" Limestone: brown, coarse, crypto-crystalline, very hard, dense, trace fracturing, strong sulphur eder on fresh break, fossiliferous, no show.
- 110" Limestone: brown, coarse crypto-crystalline, very hard, dense, slight incipient fracturing, light brown oil stain, good sulphur oil odor and taste; fairly even light golden fluorescence, all show on fracture plane.
- 1510" Limestone: very dark brown, micro to finely crystalline, few dense streaks medium crystalline, dense, very hard, few dense streaks having inclusions of brown to blue-gray chert, trace incipient fracture with slight oil show in few incipient fracture.
- 8:0" Limestone: brown to very dark brown, very fine to finely crystalline, occasional coarse cryptomerystalline, very hard, dense, occasional streaks having numerous chert inclusions, few incipient fractures having light brown stein, fair odor, spotted yellow fluorescence, few black stylolitic partings, fossiliferous, no show.
- Limestone: brown speckled very light brown, micro-crystalline, earthy, with numerous coarse crystals scattered throughout, becoming very coarse crystalline limestone in few streaks, very slightly porous, ? permeability; trace incipient fractures, fair to poor oil odor, brown stain; pin points yellow fluorescence. Show is in mass of core.
- limestone: buff, coarse crystalline, dense, trace light brown oil stain, fair oil odor, oin point yellow fluorese cence, all show in bottom 6" of unit, fossiliferous.
- 9:0" Limestone: dark brown, very finely crystalline, earthy, with numerous coerse crystals scattered throughout, very slightly porous and permeable, appears to have doed cil stain, fair to poor oil odor, very few scattered weak nine points yellow fluorescence, very fossiliferous.

Core No. 20 6090 - 6145, recovered 55!

- 14611 Limestone: brown, coarse crystalline, very slightly porous, questionable very slightly permeabile, spot light brown oil stain, good sulfur oil odor and taste, spotted light golden fluorescence, fossiliferous.
- Limestone: brown-gray, very finely crystalline, few streaks 1.00° and inclusions coarse crystalline, very hard and dense, fossiliferous, no show.
- 6101 Limestone: brown, coarse to very coarsely crystalline with dark brown earthy very finely crystalline cementing material which appears to be oil stained, good sour oil odor, poor taste, pin point silvery blue fluorescence, fossiliferous, (looks like sharks tooth - crinoid stems).
- [OThe Chert, gray, massive. 1,00 Limestone as above 61.
- 1:0" Limestone: light brown, medium crystalline, very hard, dense, trace light brown saturation,
- 0121 Chert, gray, massive.
- 210" Limestone: as above 69
- 1464 Limestone: brown, micro-crystalline, very hard, dense, few veinlets white calcite, trace styolitic partings, no show.
- 012" Chert, gray, massive.
- J 10:: Limestone, very dark brown, very finely crystalline, very hard, dense, few gray chart inclusions, good cil odor, no taste, greasy luster, spotted even yellow fluorescence, trace incipient fracture.
- 210" Limestone: brown, micro crystalline, numerous coarse crystals scattered throughout, very slight porosity, questionable permeability, greasy luster, good sulfur oil odor, poor taste, pin point yellow-blue flucrescence.
- 116" Same as l'unit 1st above.
- 01911 Limestone: brown, alternately fine and coarse, crystalline, hard and dense, trace chert, no show.
- 01511 Limestone: as above 61.
- 7 8 O !! Limestone: as above 11.
- 1'0" Limestone: as above 6
- 1,011 Limestone: brown; alternately fine and coarse crystalline, hard and dense, trace chert, no show.
- J 40: Limestone: as above 61.
- 2101 Limestone: brown, micro crystalline, very hard and dense, numerous inclusions gray chert, styolitic partings, fosciliferous, no show.
- Limestone: as above 61.
 - Limestone: very dark brown, micro crystalline, very hard and dense, fair oil odor on fresh break, very slight oil taste, questionable oil stain, no fluorescence in mass of core, good yellow fluorescence in few large spots arcund side of core, Numerous small inclusions gray chert.
 - 110" Limestone, very dark brown, finely crystalline, scattered coarse crystals, very hard and dense, inclusions gray chart no show.
 - 116" Limestone: brown-black, coarse crystalline, very hard and dense, sulfur odor on fresh break, fossiliferous, no showe

- 6'0" Limestone: very dark brown, micro to finely crystalline, very hard and dense, chert inclusions, fossiliferous, no show.
- 4'6" Limestone: very light gray, massive to finely crystaline, very hard and dense with numerous carbonaceous bryozoan in bottom 1', no show.

Core No. 21 6147 - 6203, recovered 561

- 4'0" Limestone: buff, massive to micro-crystalline, very hard and dense, fractured, good oil odor, no apparent stain, spot golden fluorescence, numerous thin carbanaceous streams numerous carbonaceous bryozoan in upper 2'.
- Limestone: micro to finely crystalline, brownish gray, very slight porosity, questionable permeability, no stein, taste, or fluorescence, carbonaceous, fossiliferous.
- Limestone: very dark brownish gray, finely crystalline, occasional coarse crystalline with dark brown earthy cementing material, very slight porosity and permeability, fair oil odor, questionable very weak fluorescence, very slightly fractured in upper 2' of unit with few spots yellow fluorescence on fracture plane, very fossiliferous.
- 15:0" Limestone: light to dark gray, coerse crystalline with finely crystalline cementing material becoming micro to finely crystalline in thin streaks, very slightly porceity questionable permeability, fair oil odor on fresh break, spotted mineral fluorescence, abundant bryczoan and replaced crinoid stems.
- 5'6" Limestone: brown, gray, coarse crystalline, carbonaceous cementing material, very slight porosity, questionable permeability, fair to good sour oil odor on fresh break, very weak spotted blue fluorescrece, fossiliferous.
- 1'6" Limestone: buff, coarse crystalline, hard and dense, slight oil on fresh break, otherwise no show.
- 2.6" Limestons: light brown, coarse crystalline, very hard and dense, single vertical fracture, slight oil odor on fresh break, otherwise no show.
- 18'6" Limestone: brown, coarse crystalline, with very dark brown earthy inter-crystalline material, porous, slight permeability, extremely broken unit believed to have been reduced to small fragments while coring, no evidence of fracturing, fair to good sour oil wor, weak spotted yellow blow fluorescence, bottom 1' of unit intact.

Core No. 22 6203 - 62581, Recovered 551

- C.T. 11, 6, 7, 7, 5, 5, 18, 18, 12, 14, 7, 9, 10, 15, 10, 17, 21,17, 11, 12, 11, 9, 10, 26, 23, 30, 32, 20, 20, 20, 22, 23, 24, 51, 45, 42, 21, 12, 28, 26, 13, 28, 19, 25, 22, 29, 31, 31, 29, 28, 25, 25, 27, 24, 21
- 400" Limestone: medium, coarsely crystalline, dark brown, hard, dense, with a soft earthy dark brown intercrystalline material having questionable oil stain, fair oil odor on fresh break, faint oil taste, few weak spots dull yellow fluorescence, numerous replaced crinoid stems.
- 1:0" Limestone: beown-gray, fine, medium crystalline, very slight porosity, questionable permeability with very dark brown

soft earthy intercrystalline material with questionable dead oil stain, faint oil taste, faint oil odor on fresh break, no fluorescence, fossiliferous.

10:0" Limestone, dark brown, very finely crystalline, with few scattered coarse crystals, very hard and dense except for a 1 interval fracture 6215-16 which is slightly porous questionably permeable, fractured with trace saturation on fracture plane, bulk of unit has slight oil odor, otherwise no show, fossiliferous.

5:00 Limestone: brown, very finely crystalline, fairly numeracus scattered coarse crystals, brown calcite, very slight trace incipient fracture faint oil odor on fresh break, otherwise no show, fossiliferous.

3º6" Limestone: very flark brown, finely crystalline, very slight porcesity, questionable permeability, fair to good oil coor on fresh break, very faint oil taste, questionable stain, no fluorescence, fossiliferous,

31'6" Limestone: dark brown, micro crystalline to very finely crystalline becoming slightly coarse crystalline bottom 5' very hard and dense, very slight trace incipient fracture, very faint sulphur odor on fresh break, very fossiliferous (plant and animal), no show.

Core No. 23 6258-6314, recovered 561

- C.T. 25,21,12,25,16,23,23,2h,20,22,18,39,32,hh,36,26,33,h0,h8,37,28,20,19,22,35,17,26,22,22,20,20,29,21,15,22,1h,19,29,16,19,23,23,32,26,15,20,28,37,67,35,29,26,h0,26,36,19。
- 2:0" Limestone, dark brown-black, crypto crystalline, massive, hard, dense, scattered coarse crystals, large masses white to light buff calcite (coraline material?), numerous poorly perserved brachipods, fragments, no stain, no fluorescence, slightly salty taste, poor sour odor on fresh break.
- 16:0" Limestone: dark brown-black, crypto-crystalline, massive, hand, dense, no show, no fluorescence, slight salty taste, poor sour odor, scattered brachipods, fragments, few scattered gray chert pellets, few scattered fractures completely filled with white coarsely crystalline calcite, some yellow fluorescence on fracture plane.
- 1'6" Limestone: dark brown-black, finely crystalline to very finely crystalline, hard, dense, no stain, fair to poor sulphur oil odor, spotted pale yellow fluorescence in mass of core, may have slight porosity and permeability salty taste.
- 3:6" Limestone: dark brown-black, crypto-crystalline, massive, hard, dense, slight incipient fracture, pale yellow fluorescence on fracture plane, fair sulphur cdor on fresh break, salty taste, no stein, scattered masses white crystalline calcite.
- 5:0" Limestone: brown-black, very fine to micro crystalline, hard, dense, scattered large pelecypod fragments, very slight sulphur odor on fresh break, salty taste, no fluorescence, no stain.
- 2:0" Limestone, brown-black, crypto crystalline, massive, hard, dense, very slight sulphur cdor on fresh break, no stain,

- salty taste, no fluorescence, scattered brachipod fragments.
- 210" Limestone: brown-black, crypto-crystalline to micro crystalline, massive, hard, dense, slight incipient fracture, slight sulphur odor on fresh break, salty taste, spotted yellow fluorescence on fracture plane, no stain, scattered styolitic partings, scattered brachipod fragments.
- 3'0" Limestone: brown-gray, finely crystalline to micro-crystalline, massive, hard, dense, vertical fracturing, slight sulphur odor on fresh break, salty taste, spotted yellow fluorescence on fracture plane, no show.
- 2'0" Limestone: brown-black, crypto-crystalline, massive, hard, dense, slight sulphur odor on fresh break, salty taste, no fluorescence, no stain, fossiliferous.
- 8:0" Limestone: brown-buff to white, fine to medium crystalline hard, dense, slight sulphur-oil odor on fresh break, salt-taste, no stain, no fluorescence, slight porosity, questionable permeability, numerous poorly preserved brachipods, styolitic.
- 4'0" Limestone, brown-buff, micro-crystalline, hard, dense, slight sulphur odor on fresh break, no stain, salty taste, trace incipient fracture throughout unit, spotted yellow fluorescence, on fracture plane, very fossiliferous, styolitic.
- 2º0" Limestone: gray-black, micro to crypto-crystalline, hard, dense, slight sulphur odor on fresh break, salty taste, no stein, no fluorescence, styolitic, fessiliferous.
- lion limestone: brown-black, finely crystalline to micro-crystalline, slight sulphur odor on fresh break, no stain, salty taste, no fluorescence, very fossiliferous, styolitic.

Core No. 24 6314-6372, recovered 58'

- C.T. 36,24,10,34,38,22,13,25,25,62,23,20,20,24,26, 15,15,52,40,43,60,29,26,30,30,30,45,25,45,25, 33,38,34,25,43,47,32,30,32,24,45,53,55,54,41, 41,16,18,64,30,31,27,28,35,35,38,36,46.
 - 810" Limestone: gray-brown, very fine to micro crystalline, large embedded clacite crystals throughout, gray motthed chert nodules (1/8" to 1/2" diameter) numerous calcite replaced crinoid stem, scattered brachipod fragments, few hairline fractures, very hard and dense, slight sulphur odor on fresh break, slight salty taste, pale yellow spotted fluorescence, mostly along fracture, no visible stein.
- 11'0" Limestone: gray, fine to medium crystalline, becoming occasionally coarse-crystalline, vertical hairline fracture, very hard and dense, very slight porosity, no apparent permeability, fair to good sulphur odor on fresh break, no fluorescence, no stain, salty taste, fossiliferous, styolitic.
 - 310" Limestone: gray, fine to medium crystalline, occasional coarse crystalline with thin stringers interbedded gray mottled chert and scattered styolites, slight sulphur oil odor on fresh break, immediately under chert layers,

good blue golden fluorescence in these zones, no fluorescence otherwise, salty taste, trace questionable stain, no apparent porosity, fossiliferous.

3'0" Limestone: brown-black, massive with scattered calcite crystals, very hard and dense, scattered nodules, dark gray chert, single vertical fracture throughout unit, spotted fluorescence on fracture plane, mud has invaded fracture, slight sulphur odor on fresh break, very slight salty taste, no stain.

15°0" Limestone, fine to medium crystalline with scattered coarse crystals, massive hard, dense, scattered light gray mottled chert nodules, trace hairline fracture with pale yellow spotted fluorescence on fracture plane, slight sulphur odor on fresh break, slight salty taste, no stain, fossiliferous.

3'0" Limestone: dark gray-black, micro-crystalline, argillaceous, massive, very hard and dense, scattered black chert nodules, vertical fracture with trace spotted pale yellow fluorescence on fracture plane, slight sulphur odor on fresh break no stain, slight salty taste, numerous replaced crinoid stems.

12°0" Limestone: gray to gray-buff, fine to medium crystalline, very hard and dense, trace gray mottled chert, some hair-line fractures with golden yellow fluorescence on fracture plane, fair to good sulphur oil odor on fresh break, very slight salty taste, questionable trace black dead oil stain, styolitic, fossiliferous.

310" Limestone: dark brown-black, massive, very hard and dense, argillaceous, few tight hairline fractures with good yellow spotted fluorescence on fracture plane, good sulphur odor on fresh break, slight salty taste, no stain, scattered poorly preserved fossiliferous fragments.

Come No. 25 6372-6430, recovered 581

C.T. - 34,13,13,14,12,9,17,15,11,10,12,10,10,14,24, 12,14,10,11,13,11,11,10,10,10,13,13,14,20,32, 35,18,18,17,20,15,15,29,26,11,12,11,10,11,7, 15,12,7,10,9,11,9,8,10,8,11,10,8.

fine to micro-crystalline, massive, hard and dense, abundant, poorly preserved crinoid stems and brachipods, fair to good sulphur oder on fresh break, very slight salty taste on fresh break, no taste, no fluorescence in mass of core, scattered vertical fracturing throughout ocre, with bright folden fluorescence, good spotted oil stain, weak oil oder at 6383-84; pale golden fluorescence, no stain in tight fracture at 6386-87 and 6390-91; bright golden fluorescence, spotted stain and weak oil oder at 6391-92; pale golden fluorescence and slight stain on tite fracture at 6397-98; weak golden fluorescence on tight fracture at 6409-10; large spots brown oil stain, spotted bright golden fluorescence and weak oil oder on calcite

filled fracture 1/32" wide at 6415-16. Thumb sized vug at 6406' pertly filled with coarse crystalline calcite, light oil stain, black tarry residue in vug, weak oil odor strong golden fluorescence.

Core No. 26 6430-6488, recovered 584

C.T. - 15,25,25,25,20,19,20,19,18,15,23,22,14,19,21, 13,17,10,15,17,18,9,15,16,6,13,21,21,11,17, 23,8,13,13,18,17,11,15,16,15,15,17,13,18,15, 16,16,16,16,17,17,10,13,13,10,15,21,13.

Immestone: darty dark brownish-black, micro crystalline, argillacecus, massive, hard, dense, very brittle, numerous thin tite calcite filled hairline fractures, slight stain and dull golden fluorescence on fracture plane at 6hhli and 6h5; otherwise no show in core, very slight salty taste to no taste, weak to good sulphur odor, few scattered poorly preserved fossils, few styolites, (note: much of the bottom 40' of core was badly broken up when taken from core berrel, giving the effect of heavy fracturing, however, it appears likely that the broken core is mostly due to the extreme brittleness of the rock and that most of the breaking occurred from partial jamming in the cope barrel. A great amount of the breaking occurs without respect to the hairline fracturing evident in the core).

Core No. 27 6488-5528, recovered 401

C.T. - 30,26,26,18,25,26,29,21,31,20,27,20,30,32,29, 24,28,15,44,20,29,30,24,25,24,9,21,47,30,29, 27,21,19,18,15,18,22,18,18,23.

Core barrel jammed at 6528; out approximately 3" in 50 minutes.

4:0" Limestone: dark brown-black, argillaceous, very fine to micro crystalline, hard, dense, massive few thin tight hairline clacite filled fractures, no fluorescence, no stain, weak sulphur odor on fresh break, no taste.

1'0" Shale: black, slightly calcareous, very slight sandy, very hard, tite, vertical hairline fracture, breaks with conchodial fracture, no fluorescence, no stain, no odor, no taste.

L'On Limestone, as above.

1.0" Shale: black, slightly calcarsous, good bedding plane cleavage, slight sulphur odor on fresh break, no show, no taste.

6:0" Limestone, dark brown-black, argillaceous, cryptocrystalline, massive, hard, dense, scattered thin calcite filled tits hairline fracture, no show.

1:6" Shale: black, calcareous, good bedding plane cleavage.

17%6" Linestone: brown to buff becoming dark brown at base, microcrystalline, massive, hard, dense, few thin black, calcareous shale partings in upper part of unit, highly fractured at 6511, 6518, and 6528, fractured at 6528 caused core barrel to jam, slight sulphur odor on fresh break, slight salty taste, no fluorescence, no stain, sparsely fossiliferous.

Core No. 28, 6530-6588, recovered 58;

C.T. - 30,41,30,33,24,37,24,26,13,24,26,23,25,25,26,23,24,23,20,21,24,17,19,16,39,40,41,20,28,31,35,29,31,31,24,36,23,35,17,35,18,28,33,20,30,16,23,29,21,19,30,48,31,35,31,45,32,58.

29:0h Limestone: brownish-black, slight argillaceous, dense, massive, hard, slightly pyritic, no stain, no fluorescence, no show, no taste, very faint sulphur edor on fresh break, few scattered gastropod and brachipod fragments.

7:0" Limestone: dark brownish-black, very argillaceous, dense, massive with few thin streaks brown, finely crystalline limestone, no odor, no stain, no fluorescence, no taste, scattered pyrite crystals and pyritized fossils, fragments, scattered styolites.

Lodge Pole

- 6:0" Limestone: brownish-black, argillaceous, dense, massive, hard, scattered tight vertical hairline fracture, fairly abundant pyrite crystals, abundant brachipods and crinoid stems, few gastroped fragments, no stain, no odor, no fluorescence, no taste.
- 16:0" Limestone: dark brownish-black, argillaceous, dense, massive, hard, few tite vertical hairline fractures, calcute filled fractures 1/16" wide fracture 6576% to 6579, very clight sulphur odor on fresh break, no stain, no fluorescence, no taste.
- Gore No. 29 6580-6646, recovered 581 0.5. - 3,22,6,5,9,6,13,7,8,8,8,8,13,7, 8,8,6,5,8,4,9,5,7,8,9,8,8,5,9, 5,12,8,12,8,10,14,17,12,6,9,14,11,7,10, 14,9,5,11,20,8,11,13,6,21,5,11,8,
 - 58:0" Limestone: dark brownish-black, slightly argillaceous becoming argillaceous toward base, slightly pyritic, massive, hard, dense, no stain, very slight sulphur too 10; no taste, trace weak dark golden fluorescence on calcite filled fracture 1/16" wide at 6593-95, otherwise no show, scattered tite vertical hairline fracturing throughout core, styolitic, scattered crinoid stems and brachipods.
- Core No. 30, 6646-6764, recovered 58*

 C.T. 8,5,5,5,6,5,5,6,6,5,5,6,6,5,5,5,5,6,5,5,6,5,5,6,6,5,5,6,6,6,8,8,8,7,6,6,8,8,7,8,8,5,6,8,7,7,14,10,14,8,8,11,7,13,13,10,10,9,10,7,7,10,6.
 - 58*0" Limestone: very dark brownish-black, argillaceous, becoming very argillaceous in thin streaks, massive, medium
 hard, becoming very hard in middle of unit, dense scattered inclusions white crystalline anhydrite, sparsely fossiliferous, l vertical calcite filled fracture 2° long

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6620-62, very few scattered very tight hairline fractures in middle of unit, very slight sulphur odor to no odor, no taste, no fluorescence, no stain.

Note: vertical fracture noted above seems to coincide with slight increase in high voltage gas readings on mud truck, no increase in low voltage.

- Core No. 31 6704-6762, recovered 58'

 C.T. 11,12,10,12,15,12,11,11,8,9,9,7,10,9,8,

 10,10,9,9,8,12,12,8,8,16,9,10,8,12,8,

 10,11,13,9,9,8,14,10,11,10,20,23,10,10,13,

 5,6,9,7,14,10,10,8,17,13,25,10,45.
 - 5810" Iimestone: very dark brownish-black, argillaceous, medium hard, massive, dense, scattered inclusions white crystal-line anhydrite, scattered crinoid and brachiped fragments very few very tite hairline vertical fractures, 2½' calcite filled fracture 1/10" wide from 6756-6758½', no taste, no stain, no fluorescence.
- - 59:0" Limestone: very dark brownish-black, argillaceous, medium hard, becoming very hard in thin streaks massive, dense, few scattered inclusions white crystalline annydrite top 5', scattered brachipod shells and crinoid stems, calcive filled vertical fractures from 6765-6768,6802-6805, 68052-6808, very few very tite hairline fractures throughout remainder of core, no odor, no taste, no fluorescence, no stain.
- Core No. 33 6821-6879, recovered 58° C.T. 7,6,9,5,9,6,5,6,8,7,7,6,9,8,5, 9,8,7,9,8,6,5,6,5,5,9,6,5,5,8, 6,5,9,5,7,6,10,7,7,5,11,8,7,7,10, 8,5,11,11,7,8,4,8,5,13,5,5,6
 - Limestone: very dark brownish-black, argillaceous, medium hard, becoming very hard in thin streaks, massive, dense, no open fractures in core, very few tite vertical hair-line fractures, very few irregular inclusions, white, crystalline, anhydrite, very sparsely fossiliferous, no odor, no stain, no fluorescence, no taste.

- Core No. 34 6879=6937, recovered 581
 - C.T. 4,5,4,6,6,4,5,6,5,5,5,5,5,5,4,5, 5,5,5,5,6,4,5,5,5,3,5,4,4,5, 4,3,3,3,4,5,3,3,4,4,4,4,4,7,10,6, 9,8,8,9,10,10,9,8,12,9,9,9,9,10
 - 23*0" Limestone: brownish-black, micro crystalline, very hard and dense, massive, argillaceous, some tite vertical hairline fractures, few pyritized fossiliferous fragments, scattered brachipods and crinoid stems, very faint sulphur odor to no cdor, no taste, no fluorescence, no stain.
 - 31.00 limestone: dark brownish-black, crypto-crystalline, very hrad and dense, massive, very brittle, most of unit badly crushed but shows tendency to break both vertically and horizontally, tite vertical hairline fracturing present where core is not crushed, few pyritized fossiliferous fractures, scattered crinoid stems, scattered large crystals calcite and calcite inclusions, no oder, no taste, no stain, no fluorescence.
 - 400 Limestone: dark brownish-black, slightly argillaceous, hard end dense, massive, some tite vertical hairline fracturing, very few scattered fossils, no odor, no taste, no fluorescence, no stain.
- Core No. 35 6937-6995, recovered 58'

 C.T. 8,7,11,7,10,7,7,8,15,9,9,7,6,15,15,

 11,5,9,8,12,7,11,7,15,3,20,5,9,11,17,

 7,10,3,10,14,10,8,12,3,15,6,10,23,15,8,

 10,9,10,6,9,9,8,6,4,8,7,9,12.
 - 17'6" Limestone: dark brownish-black, very hard and dense, styolitic, massive, slightly argillaceous, becoming very argillaceous, in thin streaks, some tite hairline vertical fractures, slightly pyritic, sparsely fossiliferous, no stain, no odor to very faint sulphur offor on fresh break, no fluorescence, no taste.
 - 20% Limestone: black, very hard and dense, groundmass with irregular masses and scattered crystals coarse crystalline, brown limestone, very crinoidal, small scattered inclusions gray chert, slightly pyritic, thin wavy streaks and lens black very argillaceous limestons throughout unit, no stain, no fluorescence, no odor, no taste.
 - 20°0" Limestone: gray-brown, medium hard to hard, dense, massive scattered masses coarse crystalline brown limestone, crincoidal, slightly pyritic, scattered brachiped shells, entire unit broken by many thin wavy streaks black vary argillaceous limestone from 1/16" to 1" thick, no stain, no fluorescence, no odor, no taste.
- Core No. 36 6995-7035°, recovered 40° C.T. - 15,20,23,24,26,25,24,33,25,30,31,25,24,24,25, 31,20,30,19,22,23,25,25,28,20,21,21,18,19,18, 21,18,16,18,23,18,17,16,25,15.

Core berrel jamed at 7035! when connection was made.

- 11'0" Limestone: gray-black, medium hard, deese, crinoidal, with thin interbedded streaks and lens black very calcareous shale, no odor, no stain, no taste, no fluorescence.
- 7'0" Limestone: dark brownish gray black, hard, dense, slightly argillaceous, becoming black and very argillaceous in thin streaks, crinoidal, no dor, no stain, no taste, no fluorescence, no odor, no stain.
- 310" Limestone: gray-black, dense, hard, slightly argillaceuss with thin streaks black calcarecus shale, scattered crimoids and brachipods, no ddor, no taste, no fluorescence, no stain,
- 19'0" Limestone: dark brownish-black, medium hard to hard, dense, massive, argillaceous, few scattered brachipods and crimaid stems, slightly pyritic, few tite vertical hairline fractures, fracture in upper part of unit apparently caused barrel to jam, no odor, no taste, no fluorescence, no stain.
- Core No. 37 7035-7075, recovered 39'
 C.T. 11,8,6,6,12,7,7,7,8,6,5,6,8,4,4,
 3,4,7,6,6,6,6,7,5,15,14,9,12,12,10,
 26,15,14,9,29,11,15,7,17,33,43,34,27,
 - 39°0" Limestone: brownish-gray to very dark gray, massive to micro crystalline, dense, fairly hard, brittle, very slight-ly argillaceous, scattered minute white calcite inclusions, slight trace pyrite, vertical fracturing 7035-36 & 7069-70, fossiliferous, no show.
- Core No. 38 7078-7136', recovered 55'

 C.T. 35,11,11,13,8,11,12,20,11,12,10,11,5,20,6,

7,16,8,5,9,12,14,5,14,7,12,7,13,11,10, 13,7,12,13,11,11,10,11,13,11,13,12,11,14,16, 22,16,17,11,10,10,10,10,12,10,10,10,8

- 27'0" Limestone: brownish-gray to very dark gray, massive to micro-crystalline, dense, fairly hard, very slightly ergillaceous, becoming very argillaceous in streaks, trace incipient fracture, very slightly pyritic, very slightly fossiliferous, no show.
- 4:0" Limestone: dark gray, massive, dense, fairly hard, trace incipient fracture, no show.
- 16:0" Limestone: same as above 27: unit, except for a few thin streaks which have no argillaceous material.
- 5:0" Limestone: dark gray, massive, micro-crystalline, fairly hard, dense, slightly argillaceous, with few thin streaks becoming black, fractured, no show.
- 300 Limestone: black, massive, dense, hard, slightly argillaceous shaly cleavage, fossiliferous, no show.
- Core No. 39 7136-7194', recovered 60'

 C.T. 18,51,18,23,31,19,16,25,32,28,30,22,20,27,20,
 25,25,32,30,23,25,20,27,25,21,24,16,20,25,21,
 18,20,20,15,16,23,20,12,17,15,19,17,16,23,19,
 20,20,26,16,23,21,25,19,32,17,23,26,28.

- 5'0" Limestone: very argillaceous; to very calcareous shale, black, dense, massive, fairly hard, trace vertical fracture, good shale cleavage in streaks, no show.
- 510" Limestone: very dark broamish-gray, massive to micro-crystalline, fairly hard, dense, slightly argillaceous, trace fracturing, no show.
- 810" Limestone: very dark gray-black, massive, dense, hard, brittle, fractured in streaks, no show,
- hith Limestone: very argillaceous, to shaly, very calcareous, black, dense, massive, fairly hard, trace vertical fracture good shale cleavage in streeks, becoming good calcarbous shale in bottom of unit.
- 8.6" Limestone: derk gray, crypto-crystalline to finely crystalline, dense, fractured in upper 2', pyritic, fessiliferous, no show.
- 4.6" Shale: black, appears carbonaceous.
- 24'0" Dolomite, very dark brownish-gray, micro-crystalline to very finely crystalline, hard, dense with numerous shale partings, slightly calcareous, fractured from 7188-91, no show.
 - 0'6" Shale: black, appears carbonaceous.
- Core No. 40 7194-7252, recovered 584
 - C. T. ~ 12,10,10,11,13,11,11,10,6,15,14,7,12,10,16, 10,26,13,16,17,15,16,18,14,10,8,8,9,8,6, 9,10,10,8,7,8,6,9,6,7,6,6,6,7,8,7,6,8,8, 6,5,13,9,7,7,9,9,7,
- 3 Ferks 1610" Do

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- 1610" Delomite, gray, massive to micro-crystalline, dense, fairly hard, with few thin streaks and inclusions ten, finally crystalline dolomite, very pyritic, occasional fracturing, no show.
- 810" Dolomite: tan to gray, massive, dense, fairly hard, frustured in streaks, no show.
- 316" Dolomite, gray, massive, argillaceous, dense, numerous tan .
 finely crystalline streaks and inclusions dolomite, no show.
- 3'6" Dolomite: ten, finely crystalline, dense, very hard, with numerous thin gray angular dolomite partings, no show.
- 3.6" Dolomite, gray, very finely crystalline, dense, very hard with numerous irregular very thin streaks argillaceous delomite scattered throughout, no show.
- 1'6" Dolomite, tan, finely crystalline, dense, very hard, no show.
- 9:6" Dolomite, very numerous tan, firely crystalline, dense, irregular inclusions in a mass of gray massive dolomite, occasional fracturing, no show.
- 316" Dolomite, gray, micro-crystalline, dense, hard, no show, trace fracturing.
- 1010" Dolomite, rusty red, argillaceous, massive to micro-crystalline dense, hard, few small inclusions green dolomite, no show, occasional fracturing.
- Core No. 41 7252-7310, recovered 58° .
 C.T. 8,12,15,3,3,6,6,7,6,7,8,6,7,7,8,8,7,6,

9,8,6,7,9,10,20,11,14,11,16,17,20,12,13, 11,13,9,17,11,17,8,9,12,9,9,14,14,12,11, 14,11,22,11,15,16,17,10,17,11

- 100 Dolomite, rusty red, micro-crystalline to massive, fairly hard, dense, very argillaceous, shale cleavage, no show, fractured.
- 2'0" Dolomite, buff, very finely crystalline, very hard and dense with numerous small inclusions very thin lenses green dolomite, shale, no show.
- 5.00 Dolomite, green, massive to micro-crystalline, hard and dense, scapy texture where massive, with numerous light pinkish red, very finely crystalline laminae dolomite scattered throughout, no show, slightly fractured.
- 8:6" Dolomite, rusty red, micro-crystalline to massive, hard and dense with few scattered inclusions green finely crystalline dolomite, no show, fractured.
- O'6" Dolomite, rusty red, massive to micro crystalline, hard and dense, with numerous fairly large inclusions pink crypto-crystalline anhydrite, no show.
- 2'G" Dolomite, rusty red, micro-crystalline to massive, scapy texture where massive, hard and dense, few inclusions and laminae green delemite, no show.
- 4'0" Dolomite, mottled, buff light red and green, becoming solid green at base, massive to micro-crystalline, hard and dense, no show, occasional fracture.
- 3'6" Dolomite, mottled pinkish buff and green, micro-crystalline, hard and dense with numerous fairly large inclusions pink crypto-crystalline anhydrite, no show.
- 510" Amhydrite, gray, translucent, crypto-crystalline to messive, dense, no show.
- 1'6" Dolomite, brown, finely crystalline, firm, slightly perosity, very slight permeability, very strong sulphur odor, calcareous, looks wet, no show.
- 360" Dolomite, medium to micro-crystalline, well developed, vary slight porosity, no permeability, fairly hard, very calcareous in upper portion, sulphur odor on break, no show.
- 310" Anhydrite, gray, translucent, crypto-crystalline, dense, no show with few thin streaks brown crystalline dolomite near base.
- 1'0" Dolomitic limestone, brown, micro-crystalline, very slight porosity, no permeability, strong sulphur odor, looks wat, no taste, no fluorescence.
- 1'0" Dolomite, brownish-gray, very finely crystalline, very hard and dense, very slightly calcareous, fractured, no show.
- 11'G" Anhydrite, gray, brown and white, massive to crypto-crystalline, translucent, no show.
- 1:0" Dolomite, limestone, brown, very finely crystalline, hard and dense, no show.
- 2'6" Dolomite, brown, micro-crystalline to very finely crystalline, dense to very slight porosity, questionable permeability, becoming saturated where porosity in streaks, good sweet oil odor and teste, fairly even bright light golden fluorescence.

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216" Dolomite, calcareous, brown, medium crystalline, well developed crystals, pencil point porosity in top becoming slightly vuggy and honey-combed toward base, very good musty oil odor and taste, fairly even to spouted bright light golden fluorescence.

Core No. 42, 7310 - 7320, recovered 11'
C.T. - 13,8,7,8,10,10,4,9,7,10

- 216" Dolomite, brown, very fine to finely crystalline, very hard, slightly calcareous, fairly good vugular porosity and streaked to even intercrystalline porosity, slight permeability, vugs very small and irregular and lined with calcite crystals, good musty oil odor and taste, greasy lustre, fairly even bright yellow fluorescence.
- 3'0" Dolomite, brown, very fine to finely crystal line, very hard, dense, except for a few thin streaks having slight vugular and inter crystalline perosity, very slight permeability, numerous streaks and inclusions white calcite, occasional very slight incipient fracturing, good show where over perosity as above 2'6".

210" Same as above 216".

3'6" Same as above 3' but having only two porosity streaks approximately 3" thick, one in muddle of unit and one contact.

Onre No. 13, 7321 - 7336, recovered 15'
C. T. - 3,5,7,5,2,6,3,4,10,5,3,5,5,6,4,

319" Delomite, brown, finely crystalline, crystals well formed, calcareous, fairly hard, fair, streaked, inter-crystalline and vugular perosity, incipient fracturing present, slight permeability, some vugs pencil size and lined with calcite crystals, good oil odor and taste, greasy lustre, fairly even bright yellow fluorescence. (show is in vugs, on incipient fracture planes and in mass of core)

410" Dolomite, brown, finely crystalline crystals well formed, calcareous, fairly hard, very slight even intercrystalline poresity, good vugular perosity in top becoming peer at base, numerous vugs filled with calcite but still ratining some porosity, slight incipient fracturing present, slight permeability, good oil coor and taste, greasy lustre, fairly even bright to dull yellow fluorescence.

2:00 Folomite, brownish gray, micro-crystalline, crystals fairly hard, calcareous with very slight inter crystalline perceit; trace vugular perceity, questionable very slight permeability, in few thin streaks, slight incipient fracturing, which might carry permeability, scattered inclusions white calcite, fair oil odor, poor taste, greasy lustre, spect-streaked dull yellow fluorescence.

hard, irregular streaks poor inter crystalline, fairly hard, irregular streaks poor inter crystalline porosity, good vugular porosity (pencil sized), vugs lined with calcite crystals, questionable slight permeability, good oil odor and taste, greasy luster and brown stain where dis-

cornable, streaked bright yellow fluorescence.

Core Mc. Na. 7336 - 7395, recovered 581

- C. T. 36,10,13,9,13,11,12,15,19,14,9,6,10,13,8,9,8,11,11,8,7,8,8,15,14,14,14,10,15,12,15,10,8,14,7,13,8,8,22,10,11,16,15,18,15,9,20,11,17,12,16,12,18,15,14,11,21,14,
 - 6:0" Dolomite, brownish gray, very fine to finely crystalline, streaked inter crystalline perosity and few very small vugs, very slightly fractured otherwise dense, questionably very slight permeability, slight calcareous, few calcite inclusions, good oil odor, good oil taste, trace free brown oil, spot-streaked bright yellow fluorescence.

4.00 Dolomite, brownish gray, finely crystalline, dense, very hard, very slightly calcareous, slight sulphur oder on break, no show.

- 7:0" Dolomite, brownish gray-brown, very fine to finally crystelline, very slight vugular with streaks inter-crystalline perosity, permeability in streaks, good oil oder and taste, brown oil stain, spot and streaked fluorescence with few streaks solid fluorescence.
- 5:0" Dolomite, brown fire to medium crystalline, hard and dense slight calcareous numerous coarse dark brown calcite crystals in upper portion, slight fractured, no show.
- 810" Dolomite, brownish-gray-brown, micro-crystalline to very crystalline, slightly calcarecus, hard and dense, becoming argillaceous in few thin streaks, no show.

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- 410" Dolomite: gray buff, micro to very finely crystalline, hard, and dense, with numerous large white inclusions anhydrite, no show.
- 6:0" Delomite, light brown, micro-medium crystelline, hard and dense, no show, slight trace fracturing.
- 156" Polemite, very light gray, micro crystalline, hard and dense, very slightly calcareous, few small inclusions white anhydrite, no show.
- 5:6" Limestone: brown, massive-micro-crystalline, fairly hard, dense, very slightly fractured, numerous dark brown, very coarse crystals aragonite (?) scattered throughout, no show.
- 210" Dolomite, light brown-gray, very fine to finely crystalline, hard and dense, no show, slightly calcareous.
- 170" Limestone: light brown, very fine crystalline, hard and dense, no show.
- 8:0" Dolomite, calcareous to dolomitic limestone, brown, very fine to finely crystalline, hard and dense, occasional black styolitic partings, no show.

Core No. 1,5, 71,00 - 71,58, recovered 581

- C.T. 12,17,9,12,11,9,13,8,10,9,10,11,9,12,10, 9,8,8,10,11,10,9,9,10,11,8,12,6,7,6, 10,8,11,12,6,12,15,9,8,8,7,8,8,8,10, 10,17,10,9,15,9,13,11,14,10,8,4,5
- 14:3" Limestone, light brownish gray, micro crystalline to massive,

- dense, hard, slightly incipient frecturing, very fossiliferous, no show.
- 1'6" Dolomite, calcareous, brownish-gray, crypto-crystalline, hard and dense, no show.
- 2º3º Limestone, dolomite, dark brownish-gray, micro-crystalline to massive, hard and dense, aragonite, numerous thin irregular black shale laminae, no show.
- 10" Limestone, brownish gray, crypto-crystalline, massive, hard, and dense, no show.
- 1'6" Dolomite, very dark gray, micro-crystalline, very celcareous hard and dense, aragonite, very fossiliferous, no show.
- 4.6" Anhydrite, gray, crypto-crystalline, dense, no show.
- l'O" Dolomite, very dark gray-black, micro-very finely crystallira, hard and dense, no show, few white anhydrite inclusions.
- 2.6" Dolomite, brown-brownish gray, very finely crystalline, hard and donse, few white crystalline anhydrite inclusions, no show.
- 5º0" Dolomite, very dark gray, massive, very hard and dense, no show.
- 3"6" Anhydrite, green-very dark green, crypto-crystalline to massive, fairly hard, dense, no show.
- 1400 Dolomite, light brown, very finely crystalline, hard and dense, with numerous irregular streaks and inclusions and individual crypto-crystals anhydrite scattered throughout, no show.
- 1'0" Dolomite, gray, massive-micro-crystalline, hard and dense, no show.
- 3'6" Anhydrite, brownish gray to gray, very finely crystalline, hard and dense, no show.
- 400 Dolomite, gray, massive-micro-crystalline, very hard and dense, smooth textured, no show.
- 4.0" Anhydrite, brown-brownish gray, crypto crystalline, hard and dense, no show.
- 116" Dolomite, dark brown, finely crystalline, fairly hard, trace inter-crystalline porosity, questionably very slight permeability, strong sulphur odor on fresh break, no show.

Core No. 46, 7458 - 7516, recovered 581

- C.T. 9,11,4,4,5,11,5,7,8,8,4,6,7,14,7,5, 4,10,15,15,10,10,15,10,10,10,6,8,8,8,8, 11,10,5,7,11,11,8,9,10,9,9,9,12,7,9, 7,5,5,7,6,5,6,5,5,8,5,7,
- 1:0" Limestone, dolomite, dark brownish-gray, massive with few scattered fine crystals, hard, dense to questionably very slightly porous, no show.
- 1'6" Dolomite, brown, finely crystalline, some inter-crystalline porosity, questionably very slight permeability, fairly hard, sulphur odor on fresh break, no show.
- 3'6" Limestone: dark brownish-gray, very hard and dense, microcrystalline to massive, slightly dolemitic, no slow.
- 1.16" Dolomite, brown, finely crystalline, hard, very slight porosi questionable permeability, becoming very anhydritic and very finely crystalline toward base, sulphur odor on fresh break, no show.

- 1'0" Dolomite, same as above 4'6" except being hard and dense, 6'6" Dolomite, gray to light gray, micro crystalline, massive, very hard and dense, no show.
- 4:0" Dolomite and anhydrite, interlaminated, brownish gray to gray, micro-crystalline, massive, hard and dense, no show.
- 2'0" Dolomite, dark brown, finely crystalline, hard and dense, no show.
- 500 Dolomite, dark brown, finely crystalline, fairly hard, trace streaked inter-crystalline and vesicular porosity, numerous inclusions and fairly thick (30) white accoular anhydrite, very slight oil oder where porosity, very faint bluish fluorescence, looks wet, slightly fractured in lower portion.
- 6:0" Dolomite, brownish-gray, finely crystalline, hard and dense, numerous white crystalline anhydrite inclusions scattered throughout, no show.
- 12'0" Dolomite, very dark gray, micro-crystalline, very hard and dense, trace incipient fracturing, few dark brownish-gray thin anhydrite streaks in lower 2'.
- 2'0" Anhydrite, gray-light gray, massive, fairly hard, dense, no show.
- 500 Dolomite, dark brown, finely crystalline, hard and dense, slightly fractured with white anhydrite crystals on fracture planes, no show.
- 2000 Dolomite, light brown, micro to very finely crystalline, hard, dense, very slightly fractured, locks wet, no show.
- 116" Anhydrite, brownish-gray, massive, danse, no show.
- 2'0" Dolomite, brown, finely crystalline, hard end dense, numerous small inclusions white calcite, no show.

Cora #17, 7515-7557, recovered L1

- C.T. 7,4,10,4,6,4,4,5,5,11,6,8,8,8,9, 16,14,5,13,10,10,10,7,7,8,6,4,12,3,11,4,4,5,6,11,4,1,7,7,3,12
- ll'O" Dolomite, brown, finely crystalline, fairly hard, fairly good inter crystalline porosity with some porosity, very slight permeability, permeability becoming dense in few thin streaks, few scattered white calcite inclusions, slight sulphur odor on fresh break, no show.
- 2'6" Dolomite, light gray, micro-crystalline, very hard and dense slight incipient fracturing, no show.
- 3,00 Anhydrite, gray, massive, hard and dense with thin streaks gray brown dolomite throughout, no show.
- 2 0 Dolomite, ten, micro crystalline, fairly hard, very slightly intercrystalline porosity, slight trace vugular porosity, yery slight permeability, few inclusions white calcive, sulphur odor on fresh break, looks wet, no show.
- 1936 Dolomite, dark brown, finely crystalline, fairly hard, streaked and uneven inter crystalline perceity, slight trace vugular porosity, becoming dense in spots and streaks, few white dolomite crystalline crystala, occasional incipient fracturing, strong sulphur odor on fresh break, no show.

Core No. 48, 7557 - 7599, recovered 42'

- C.T. 5,4,11,6,5,6,3,3,6,6,7,6,6,5,5,5,5,5,5,5,7, 4,4,4,5,3,6,6,18,6,10,7,7,7,8,6,6,7,6,7,8,
- 1410" Dolomite, micro-crystalline, very light gray-green, very hard end dense, very calcareous in top, pyritic, no show,
- 4'6" Cypsum, white to very light gray, soft, crystalline, danse, no show.
- 510" Anhydrite, brownish gray-green, massive-crypto-crystalling, dense, fairly hard, no show.
- 210" Limestone, gray to very dark brownish gray, massive to very finely crystalline in streaks, very hard and dense, trace incipient fracturing, no show.
- 810" Dolomite, brown, finely crystalline, hard, slightly porcus with occasional irregular spots and streaks becoming dense, porosity is intercrystalline with trace some vugular porceity, very slightly permeability to permeability, calcite crystals, scattered throughout, very strong sulphur cdor, no show,
- 2:6" Dolomite, gray, very fine to finely crystalline, hard and dense, no show.
- 3'6" Dolomite, same as above 8' except having no odor and becoming more dense.
- 3'0" Limestone: very dark brown, massive, hard and dense, occasional very dark brownish-black shale partings, no show.
- 9:6" Dolomite, brown, very fine to finely crystalline, very hard and dense, no show.

Core No. 49, 7599-7657, recovered 58º

- C.T. 11,9,10,8,7,10,7,4,5,6,5,8,9,5,11 8,8,10,5,5,7,6,4,5,5,4,7,5,5,10, 16,7,6,5,17,6,8,7,9,5,13,8,10,7,7, 7,6,10,8,7,10,7,7,6,10,8,5,9,
 - 3°0" Dolomite, gray, very fine crystalline, very hard and dense, no show.
- 236" Anhydrite, brownish gray, massive, feirly hard, dense, no shows
- 7°0" Dolomite, brown, very fine crystalline, fairly hard, slightly inter-crystalline porosity, questionable very slight permeability, looks wet, no show.
- 14.6" Dolomite, brown, fine crystal line, dense to very slightly intercrystalline porosity in streaks, no permeability, few white calcite inclusions, looks wet, no show.
- 1000 Delomite, gray, micro-very fine crystalline, hard and dense, no show.
- 1'0" Anhydrite, brownish gray, massive, dense, fairly hard, no show.
- 1º0" Dolomite, gray, very fine crystalline, hard and dense, me shows
- L'O" Anhydrite, brownish gray, massive, fairly hard, dense, with numerous laminae gray dolomite throughout, becoming very dolomitic at base, no show.
- 1'6" Dolomite, brown, micro-crystalline, hard, very slight intercrystalline porosity, numerous thin lenses and inclusions anhydrite, strong sulphur odor, no show.

- 310" Anhydrite, derk brown, massive, feirly hard, dense, impure, no show, possibly limey.
- 1'0" Dolomits, very dark gray to black, massive, dense, hard, few shale partings, no show.
- 3'0" Anhydrite, brownish-gray, massive, dense, fairly hard, no show.
- 2º6" Dolomite, light brown, massive-micro-crystalline, hard and dense, very anhydritic, no show.
- 210 Dolomits, dark brown, very finely crystalline, hard and dense, no show.
- 910" Anhydrite, light brownish, gray, massive, dense, fairly hard, no show.
- O'6" Dolomite, light brown, massive to micro-crystalline, slight inter-crystalline porosity, no permeability, very calcareous, looks wet, no show.
- Dolomite, light brownish-brown, micro-crystalline to massive in few streaks, hard and dense with few very thin streaks inter-crystalline porosity, questionable permeability, one vertical fracture in unit with calcite on fracture planes, porosity zones and fracture planes have good oil odor, fair oil taste, spotted golden fluorescence, no show in dense portion.
- 0'10" Anhydrite, brownish-gray, massive, dense, fairly hard, no show.
- O'6" Dolomite, tem, micro-crystalline, massive, hard, trace of inter-crystalline porosity, locks met, few veinlets white calcite, no show.
- 1'0" Anhydrite, bromish-gray, massive, danse, hard, no show.
 0'8" Dolomite, tan, finely crystalline, very hard and dense, glassy lustre, no show.
- Core No. 50 7659 77171, recovered 581
 - C.T. 10, 7, 10, 10, 10, 13, 5, 10, 9, 7, 7, 6, 8, 8, 10, 8, 10, 9, 8, 7, 5, 9, 4, 6, 6, 6, 8, 6, 5, 6, 9, 8, 6, 4, 6, 7, 4, 7, 10, 5, 8, 5, 9, 7, 5, 6, 14, 16, 6, 12, 10, 11, 22, 12, 15, 22, 10
 - 2100 Dolomite, brown, micro-very fine crystalline, porosity in top becoming very slightly porous at base, fairly hard, questionable permeability, looks wet, no show.
 - Dolomite, enhydritic, vary dark gray, micro-crystalline, hard and dense, few thin streaks pure very finely crystalline dolomite, occasional very slightly argillaceous, no show.
 - 1.6 Anhydrite, brownish-gray, massive, hard and dense, no show.
 2.6 Anhydritic dolomite, very dark gray, micro-crystalline, very
 - hard and dense, no show.
 - Dolomite, brown, very fine to finely crystalline, hard and dense, except for occasional very slightly porous spots, slightly fractured, fair musty oil odor on fracture planes, spotted to streaked bright gold fluorescence, greasy lustre, general appearance of unit is wet. All show on fracture planes.

- 1946" Dolomite, brown, finely crystalline, dense to questionable very slight porosity, no permeability, occasionally fractured, fractures having greasy wet look, weak spot yellow blue fluorescence, musty oil odor, no show in mass of core.
 - 1'0" Dolomite, gray, micro-crystalline, very hard and dense, no show.
 - 110" Anhydrite, very light gray, firm dense, no show.
 - O'6" Dolomite, dark brown, micro-crystalline, hard and dense, numerous large anhydrite crystals scattered throughout, no show.
 - 1º0" Dolomite, dark brown, finely crystalline, hard, very slightly porous, questionable permeebility, looks wet, sulphur cdor, no show.
 - 2.6" Anhydritic dolomite, light brown, finely crystalline, massive in top 6", hard end dense, no show.
 - 5:0" Dolomite, brown, finely crystalline, hard and dense, slightly calcitic, trace of fracturing, dead oil stain on fracture planes, musty oil odor, spotted light gold fluorescence, appears wet.
 - 2:0" Dolomite, dark brown, finely crystalline, slightly porcue in top becoming very porous at base, questionable permeability, numerous fossiliferous molds partially filled with calcite having dead oil stein, musty oil odor, spotted light golden fluorescence, general wat look.
- Core No. 51 7718 7776', recovered 58'
 - C.T. 6, 5, 5, 7, 8, 5, 6, 7, 5, 4, 5, 6, 4, 4, 4, 8, 6, 3, 7, 7, 11, 6, 6, 7, 7, 9, 6, 6, 6, 7, 5, 4, 5, 4, 5, 6, 5, 6, 9, 4, 4, 4, 5, 6, 5, 5, 5, 5, 10, 17, 6, 13, 11, 16, 9, 14, 14, 20
 - 13°0" Dolomite, brown, finely crystalline, dense to very slightly porous in few irregular scots, (porosity inter-crystalline), very calcitic, trace incipient fracturing with dead oil show on fracture planes, musty oil odor, dark brown stain, spotted yellow fluorescence, no show in mass of core.
 - 12'C" Dolomite, very dark gray to brownish-gray, micro-crystalline to massive in few streaks, very hard and dense, brittle, calcareous in streaks, sulphur odor on fresh break, no show.
 - 296" Limestone, very dark gray to very dark brownish-gray, massive to micro-crystalline, very hard and dense, brittle, slightly dolomitic, no show.
 - 116" Dolomite, brown, micro-crystelline, hard and dense, slightly amhydritic, H2S odor on fresh break, no show.
 - Dolomite, dark brown, very fine to finely crystalline, danse, to very slightly porous, (porosity inter-crystalline), hard, strong H2S odor on fresh break, no show.
 - 2010" Dolomite, dark brown to very dark brownish-gray, microcrystalline to very finely crystalline, dense with very slight trace inter-crystalline porosity, no permeability, few scattered anhydritic crystals, occasional black stylulitic and shale partings, sulphur (H2S) odor on fresh break, no show.
 - L'O" Dolomite, very dark gray, micro-crystalline, very hard and dense, brittle, trace fracturing with calcite covering fracture planes, no show.

- Core No. 52 7776 78341, recovered 581

 C.T. 10, 5, 4, 9, 8, 7, 8, 7, 7, 6, 6, 5, 6, 6, 5, 6, 5, 11, 7, 6, 5, 8, 9, 6, 5, 15, 10, 8, 10, 8, 10, 8, 8, 4, 5, 8, 9, 9, 6, 7, 5, 6, 4, 8, 7, 9, 7, 7, 10, 5, 7, 8, 5, 5, 5, 15, 15, 10
 - Dolomite, very dark gray, micro-crystalline, hard and brittle, dense with few very slightly porcus spots, strong H2S odor on fresh break, no show.
 - 21'6" Souris River Dolomite, gray, very dark brownish-gray, micro-crystalline, hard and dense, slightly pyritic, occasional HoS odor on fresh break, no show.
 - 1'0" Anhydrite, gray, massive, dense, no show.
 - 310" Limestone, very dark brown, massive micro-crystalline, very hard and dense, occasionally fractured, no show.
 - 10'6" Limestone, dark brown, micro-crystalline, finely crystalline, occasional streaks massive, very hard and dense, occasional black shale partings, trace of fracturing, no show.
 - 1210" Dolomite, gray to very light tan, micro-crystalline, very hard and dense, no show.
 - 6'6" Dolomite, very dark gray-brown, very fine to finely crystalline, hard and dense, slightly fractured with calcite on fracture planes, no show.
- COTE No. 53 783h 7891', recovered 57'

 C.T. 7, 10, 10, 10, 13, 12, 10, 10, 11, 12, 6, 21, 8, 11, 20,

 13, 15, 10, 13, 13, 12, 17, 8, 1h, 7, 10, 10, 8, 9, 9,

 6, 6, 7, 3, 6, 6, 6, 7, 7, 7, 8, 10, 7, 5, 9, 10, 6, 8, 13, 12,

 12, 8, 11, 10, 5, 1, 8
 - 30°0" Dolomite, gray, very dark gray, micro to very finely crystalline, very hard, brittle, dense except for two 1° streaks very slight porosity at 7838° and 7840°, few scattered thin white calcite veins, slightly anhydritic with few small anhydrite lenses toward base, no show.
 - JiOn Dolomite, brown, finely crystalline, hard, unevenly very slight porosity, no permeability, some incipient fracturing, HoS odor on fresh break, no show.
 - 17:0" Dolomite, very dark gray, micro-crystalline, very hard and dense, brittle, with very thin streaks and inclusions anhydrite scattered throughout, no show.
 - Dolomite, light brown-ten, very finely crystalline, hard, questionable very slight porosity, no permeability, scattered anhydrite crystals, looks wet, no show.
 - 6:0" Dolomite, very dark gray, micro-crystalline to very finely crystalline, hard and dense, brittle, trace of fracturing, no show.
- Core No. 51 7891 7949', recovered 58'

 C.T. 4. 9, 7, 8, 8, 6, 12, 11, 10, 8, 9, 7, 6, 6, 7, 9, 8, 8, 5, 11, 9, 6, 16, 3, 6, 9, 10, 10, 7, 7, 7, 8, 8, 1, 8, 8, 8, 19, 8, 10, 11, 6, 6, 7, 8, 10, 11, 7, 8, 9, 8, 12, 8, 8, 6, 5, 9, 10

- 5'C" Dolomite, dark gray, micro-crystalline, very hard and dense, bfittle, incident fracturing, no show.
- 3'0" Anhydrite, dark brownish-gray, massive, dense, no show.
- 2310" Dolcodte, very dark gray to brownish-gray, micro to very finely crystalline, very hard and dense, brittle, very anhydritic in upper 7', occasional fracturing throughout with anhydrite crystals on fracture planes, occasional thin black shale partings with pyritic crystals, no show.
- Dolomito, very derk brownish-gray, massive with scattered masses finely crystalline, very hard and dense, fractured, very calcareous, no show.
- 25'0" Dolomite, brownish-gray to very dark gray, micro-crystalline, very hard and dense, brittle, trace of fracturing and incipient fracturing, very few anhydritic streaks, scattered black anhydritic shale partings and thin streaks, no show.
- Core No. 55 7949 80081, recovered 591
 - C.T. 3, 4, 9, 6, 10, 8, 6, 7, 9, 5, 5, 9, 4, 5, 10, 3, 7, 7, 6, 6, 6, 6, 4, 4, 8, 6, 12, 3, 3, 7, 5, 8, 10, 9, 6, 8, 9, 7, 8, 6, 7, 9, 8, 6, 5, 5, 7, 7, 8, 8, 9, 5, 5, 7, 6, 8, 7, 5
 - 19'0" Dolomite, gray to very dark gray or black micro-crystalline, very hard and dense, brittle, becoming shaley in thin streaks, occasional incipient fracturing, no show.
 - 210" Anhydrite, gray, massive, dense, no show.
 - 10'0" Dolomite, dark gray, finely crystalline, very hard and dense, brittle, few vertical veinlets white anhydrite, no show.
 - Dolomite, gray to very dark gray or black, micro-crystalling to massive in thin streaks, very hard and dense, brittle, becoming argillaceous with shale cleavage in few streaks, no show.
 - Dolomite, very dark gray, micro-crystalline, very hard and dense, brittle, conchoidal fracture, very slightly snhydritic in top of unit, slight trace of fracturing, no show.
 - 8°0" Dolomite, very light gray, micro-crystalline, very hard and dense, brittle, no show.
- Core No. 56 8010 8068', recovered 56'
 - C.T. 12, 14, 9, 5, 5, 7, 8, 7, 5, 6, 7, 4, 5, 7, 6, 4, 4, 5, 5, 5, 5, 6, 7, 5, 5, 5, 4, 5, 5, 4, 3, 5, 4, 6, 5, 8, 14, 7, 7, 6, 6, 4, 6, 6, 8, 7, 8, 12, 9, 10, 11, 22, 5, 5, 10, 8, 12, 11
 - 11'0" Dolomite, light gray to dark brownish-gray, micro-crystelline, very hard and dense, brittle with fairly numerous incipient fractures situated at varying engles, a l" black shale streak in middle of unit.
 - 16:6" Dawson Bay Dolomite, dark brown, very finely crystalline, hard, slightly inter-crystalline porosity, no permeability becoming dense in few streaks, moderately fractured with some incipient fracturing, very few scattered small vugs partially filled with calcite crystals, strong H2S odor on fresh break, looks wet, no show.
 - 13:6" Dolomite, dark brown, very finely crystalline, hard, dense. to questionabley very slightly porous, no permeability,

- 10:00 Delemite, same as above 13:60 but having numerous fairly large wags, numerous fractures and incipient fractures, no show.
 - 2º0" Dolomite, same as above 13º6", no show.
 - 3º0° Delamite, very dark brownish-gray, very finely crystalline, very hard and dense, fractured in lower 1º, fracture planes covered with calcite crystals having bits of black asphaltic residue scattered among them, no show.

Nors No. 57 8068 - 8126, recovered 58'

- C.T. 3, 3, 9, 9, 9, 7, 11, 6, 6, 9, 4, 6, 4, 8, 5, 4, 7, 4, 16, 8, 6, 8, 10, 8, 9, 9, 9, 9, 10, 9, 10, 9, 10, 10, 8, 9, 7, 7, 9, 14, 8, 11, 6, 7, 10, 8, 7, 6, 9, 7, 8, 8, 11, 6, 7, 12, 9, 10
- 12:0" Dolomite, very dark gray, micro to very finely crystalline, very hard and dense, numerous irregular very thin black shale partings throughout, no show.
- hard and dense, brittle, very slightly pyritic, no show.
- 5'0" Dolomite, tan, massive, very hard and dense, brittle, pyritic, no show.
- 5:00 Dolomite, reddish-brown, micro-crystalline to massive, very hard and dense, brittle, pyritic, few very thin white crystalline anhydrite veinlets, no show.
- 2:65 Dolomite, very dark gray, micro-crystalline to messive, very hard and dense, brittle, few very thin white crystalline annuality veinlets, no show.
- hion Dolomite, reddish-brown, micro-crystalline, very hard and dense, very slightly pyritic, no show.
- 1303 Dolomite, mottled reddish-brown and gray, micro-czystalline, very hard and dense, no show.
- 5'0" Dolomite, gray to dark gray, micro-crystalline, very hard and dense, no show.
- Dolomite, dark gray with tan and reddish-tan mottling, tan colors have shape suggesting detrital matrix, micro to waxy finely crystalline, very hard and dense, no show.
- 5°0" Dolomite, derk gray, micro to very finely crystalline, vary hard and dense, very slightly anhydritic, no show.
- 2°6" Dolomite, dark brownish-gray, micro-crystalline, very hard and dense, no show.
- 690" Anhydrite, dark brownish-gray, massive, dense, fairly hard, delomitic, several gray delomitic stracks in top, numerous laminae very dark gray to black shale throughout, no show.
- John Mo. 58 8125 81621, recovered 361

 C.T. 12, 5, 4, 6, 6, 7, 7, 5, 5, 6, 8, 4, 4, 8, 4, 6, 6, 7, 3, 5, 5, 7, 5, 5, 6, 7, 4, 10, 6, 7, 10, 10, 9, 9, 11, 11

- 4.6n Dolomite, dark brownish-gray, micro-crystalline, very hard and dense, brittle, no show.
- 646" Dolomite, dark brownish-gray, micro to very finely crystalline, very hard and dense, numerous irregular streaks and inclusions dark brownish-gray massive dolomitic anhydrite, no show.
- 25°0° Dolomite, gray to very dark gray or black, very hard and dense, very fine to finely crystalline, numerous black shale partings, becoming argillaceous in thin streaks and in bottom 5', scattered very small white crystalline anhydrite inclusions, coasional fracturing and incipient fracturing, extremely fractured in bottom 3', no show.
- Core No. 59 8165 8220', recovered 54'
 - C.T. 4, 7, 6, 8, 5, 5, 7, 10, 5, 6, 5, 5, 5, 6, 4, 5, 9, 4, 5, 4, 3, 5, 5, 4, 4, 6, 6, 10, 5, 5, 6, 5, 5, 5, 8, 3, 5, 10, 10, 12, 10, 18, 16, 8, 10, 14, 5, 11, 12, 18, 50
 - 15'6" Dolomite, dark brownish-gray, micro to very finely crystalline, very hard and dense, occasional vertical white crystalline anhydrite veinlets, numerous irregular laminae black shale throughout, slight trace of fracturing, no show.
 - 216" Interlake Dolomite, dark brownish-gray, micro to very finely crystalline, hard and dense, few pencil sized vugs lined with calcite crystals and containing some black asohaltic residue, no show.
 - 2103 Dolomite, light gray, micro-crystalline, very hard and dense, slightly fractured no show.
 - 7:0" Dolomite, mottled and splotchy, white to light gray, very fine to medium crystalline, very hard, dense to very slight-ly inter-crystalline porosity, fairly well fractured, numerous pencil point to cencil sized vugs lined with medium dolomite crystals, very permeable, numerous minute gray stylolites throughout, slight H2S odor on fresh break, brackish sulphur water taste, looks wet, no show.
 - Dolomite, brown, very finely crystalline, hard and dense, very few pencil point vugs, extremely fractured, no show.
 - Dolomite, white to light gray in top becoming light graybrown in bottom, colors splotchy and irregular, very fine to finely crystalline, crystals not so clearly developed in white areas, questionable very slight inter-crystalline porosity, numerous pencil point to bencil sized vugs throughout, slight musty odor on fresh break, strong salty taste from freshly opened vugs, looks wet, no show.
 - 7'0" Dolomite, light tanish-gray, micro to very finely crystalline, very hard and dense, fractured in bottom 1', no show.
 - 210 Dolomite, light brownish-gray, very finely crystalline, very hard end dense, extremely fractured and broken, no show.
 - 5:0" Dolomite, brown, very fine to finely crystalline, extramely hard, dense except for few scattered very small (pencil point) vugs, occasional slight fractures, broken in bottom 6", no show.

- Come No. 60 8220 \Rightarrow 8278 $^{\circ}$, recovered 58 $^{\circ}$
 - C.T. 7, 3, 7, 3, 8, 6, 3, 7, 11, 9, 8, 8, 9, 11, 7, 5, 5, 10, 5, 10, 5, 6, 6, 8, 4, 7, 5, 16, 3, 6, 11, 10, 10, 9, 6, 11, 11, 10, 11, 10, 10, 10, 10, 10, 11, 13, 12, 13, 10, 11, 13, 10, 10, 15, 15, 18, 15, 15
 - Dolomite, light gray to light grayish-brown, becoming dark gray in thin streaks, very hard, dense except for scattered pencil point vugs, becoming very vugular (pencil sized) and white to light gray from 8272-8273 and 8275-8277, occasional fractures throughout core becoming more fractured toward base, vugs look very wet, taste salty, slight H₂S odor on fresh break, no show.
- Core To 61. 8276 83361, recovered 571
 - 0.1. 2, 3, 2, 4, 3, 6, 3, 3, 3, 6, 4, 3, 3, 4, 3, 2, 5, 6, 6, 6, 6, 6, 6, 5, 7, 7, 3, 5, 6, 4, 6, 5, 6, 8, 4, 5, 6, 5, 5, 5, 4, 5, 3, 4, 5, 3, 4, 3, 5, 5,
 - Dolomite, light grayish-brown to grayish brown, micro to very finely crystalline, very hard and dense except for top 3' which has very few scattered pencil point vugs, sulphur odor on fresh break, slight trace fracturing, no show.
 - Dolomite, light grayish-brown to grayish brown, micro to finely crystalline, hard, mostly dense, few irregular streaks very slight inter-crystalline porosity, few scattered pencil point to tencil sized vugs becoming fairly numerous in few very thin streaks, few occasional fractures, sulphur odor on fresh break, looks wet, no show.
 - Dolomite, light ten to tan and gray-brown, very finely crystalline becoming micro-crystalline in thin streaks, hard, dense except for occasional very thin streaks bencil point vugs, fractured from 6317-8319 and from 8326-8331, extremely broken 8333-8336, very slight H₂S odor on fresh break, looks wet in vugs, no show.
- Come No. 62 8336 8356*, recovered 17*

 0.1. 2, 3, 3, 8, 3, 7, 5, 7, 5, 8, 7, 6, 7, 7, 5, 10, 13, 9, 12
 - Dolomite, brownish-gray, very fine to finely crystalline, hard, dense except for few scattered pencil point vugs, unit extremely fractured and broken so that relative position of vieces is unknown, some pieces have musty dead oil odor on fresh break, trace of dead oil stain in some vugs, few droplets dead oil noted on one incipient fracture plane, mass of unit looks wet.
 - Dolomite, light tenish-gray, finely crystalline with scattered medium to coarse crystals, dense except for few scattered pencil point vugs lined with dolomite crystals, slight musty dead oil odor on fresh break, some vugs have black asphaltic residue, mass of core looks wet, few fractures and incipient fractures.

- Delomite, light buff-gray, micro-crystalline to finely crystalline, hard, dense, except for rare pencil point vugs, moderately fractured with few incipient fractures, few fractures have flakes black asphaltic residue on planes, otherwise no show.
- 5'0" Dolomite, very light grayish-brown, micro to very finaly crystalline, hard, dense except for rare pencil point vugs having flakes black asphaltic residue, fractured extremely broken in lower 4', no show other than asphaltic.
- Core No. 63 6355 8405, recovered 50
 - C.T. 4, 5, 10, 12, 7, 12, 11, 10, 10, 12, 18, 10, 9, 10, 11 16, 12, 16, 17, 9, 7, 21, 7, 10, 9, 8, 9, 15, 22, 17, 16, 11, 19, 20, 20, 20, 23, 20, 20, 24, 18, 17, 13, 26, 27, 28, 27, 28, 29, 31
 - 2210" Dolomite, light grayIsh-brown to grayIsh-brown, micro to very finely crystalline, hard, dense, moderately fractured with spots of flakey black asphaltic residue on fracture planes, rare pencil point vugs which look wet and have some black asphaltic residue filling, otherwise no show, slight H2S odor on fresh break.
 - 8:0" Dolomite, brownish-gray to dark brownish-gray, micro to very finely crystalline, very hard, dense except for rare scattered pencil point vugs which look wet, fairly well fractured, some fractures filled with crystalline anhydrite, few black stylolitic partings with associated pyritics, slight HoS odor on fresh break, no show.
 - 10:0" Dolomite, light grayish-brown, slightly darker in very thin streaks giving bended appearance, micro to very finely crystalline, hard, dense, few slightly argillaceous partings, very few fractures, slightly incipient fractures, no show.
 - 10'0" Dolomite, dark grayish-brown, micro crystalline becoming finely crystalline toward base, hard, dense except for rare pencil point vugs, few fractures throughout, extra fractured and broken 8403-8405', few slightly argillaceous streaks giving shale cleavage, no show.
- Core No. 64 8406 = 84191, recovered 91 C.T. = 7, 6, 8, 11, 17, 5, 4, 14, 19, 15, 16, 15, 17
 - Dolomite, grayish-brown in top becoming light grayish-tan toward base with occasional spots very light gray-white, very finely crystalline, fair vugular porosity, vugs irregular shaped, incipient fractures throughout, some partially filled fractures with crystalline anhydrite and dolomite, few streaks having minute veinlets black asphaltic matrix, trace black asphaltic in vugs and fractures, listreak from 8409-8410 has few small coral fossils having voids between septae, all porosity in core looks wet, no show other them asphaltic.

- Core No. 65 8419 8477', recovered 58'

 C.T. 10, 10, 8, 5, 5, 7, 9, 7, 9, 6, 6, 7, 5, 9, 8, 10, 4, 7, 9, 5, 7, 6, 7, 7, 9, 8, 7, 7, 9, 13, 5, 8, 12, 22, 10, 13, 22, 20, 16, 12, 9, 15, 15, 15, 33, 30, 8, 28, 20, 20, 31, 22, 38, 15, 19, 20, 20, 17
 - Dolomite, motitled light to dary gray, very finely crystalline, hard, poor scattered pencil point vuggy porosity, some fracturing with anhydrite crystals along fracture planes having secondary inter-crystalline porosity, looks wet, no show.
 - 6:0" Dolomite, light to medium arounish-gray, micro-crystalline, dense, hard, fractured with anhydrite crystals on fracture planes, no show.
 - 10'0" Delomite, light to derk gray, very fine to finely crystalline, hard, poor scattered pencil point vuggy porosity, some fracturing with anhydrite crystals along fracture, looks wet in streaks, no show.
 - 12'0" Dolomite, light to medium grayish-brown, micro-crystalline, hard, trace tight fractures with anhydrite crystals along planes, poor scattered cencil coint vuggy porosity at top appears wet; large pencil sized vugs toward base which look wet, salty, no show.
 - 5.0° Dolomite, dark grayish-brown, massive to micro-crystalline, hard, dense, some horizontal cleavage, appears argillaceous in laminae, no show.
 - 13'0" Dolomite, light gray to light grayish-brown, hard, becoming harder toward base, micro-crystalline, some tight vertical fractures, no show.
 - 210" Dolomite, light to medium gray-brown, extremely hard, microcrystalline, dense, one large white chert nodule, mass of core appears siliceous (scratches !mife blade), no show.
 - 8:0" Dolomite, light grayIsh-brown, very fine to finely crystalline, very hard, dense except for bottom 1' which has tight vertical fractures and trace of vuggy porosity, looks wet, no show.
- Core No. 66 8477 85351, recovered 581
 - C.T. 5, 4, 4, 5, 5, 5, 5, 7, 11, 30, 16, 10, 15, 16, 17, 19, 18, 23, 36, 23, 25, 24, 24, 18, 22, 18, 21, 22, 24, 20, 30, 16, 13, 21, 22, 28, 10, 15, 17, 18, 15, 20, 15, 15, 30, 20, 20, 35, 20, 15, 24, 15, 15, 14, 15, 15, 25, 20
 - 47°0" Dolomite, light gray-buff in top becoming light brownishgray toward base, with few scattered very small to very
 large light gray massive chert nodules, very finely crystalline, extremely hard, probably siliceous, danse except
 for few scattered poorly developed oin point to thumb sized
 vugs, some vugs lined with quartzitic crystals, occasional
 incipient fracturing, dead oil stain in one vug, all vugs
 look wet, slight H2S oder on fresh break.
 - 11'0" Dolomite, light graylsh-tan, micro-crystalline, extremely hard, probable slight siliceous, dense, very little fracturing, with few small to very large scattered light gray massive chert nodules, slight H2S odor on fresh break, no show

- Core No. 67 8535 85551, recovered 20! C.T. - 10, 10, 10, 10, 10, 15, 15, 13, 10, 10, 13, 17, 13, 13, 22, 20, 23, 30, 45
 - 20:0" Dolomite, grayish-buff in top becoming light brownish-gray toward base, very finely crystalline, very hard and defise, fractured in upper 1:6" and in lower 8:, numerous white irregular shaped chart nodules 8545-8546: and 8554-8555, few scattered very thin veinlets quartz, slight H₂S oder on fresh break, no show, few very dark gray pyritic shale partings 8552-8553.
- Core No. 68 8555 8566', recovered 7'
 C.T. 11, 19, 22, 11, 16, 16, 15, 13, 17, 22, 30
 - 500" Dolomite, light buff-gray, micro to very finely crystalline, very hard, dense except for rare pencil point vugs which look wet, fractured throughout, extremely fractured and broken in lower 1.6", very few finger sized nodules, white chert, dull yellow tan minute fluorescence, slight H2S coor on fresh break, no show.
 - Dolomite, medium gray, micro to very finely crystalline, fairly hard, dense, fractured, numerous very thin laminao argillaceous dolomite throughout, no show.
- Core No. 69 8566 86221, recovered 581
 - C.T. 3, 22, 22, 21, 23, 20, 20, 17, 15, 12, 15, 15, 18, 23, 11, 16, 22, 20, 20, 21, 20, 20, 15, 22, 22, 31, 34, 19, 18, 14, 32, 30, 8, 19, 18, 28, 24, 9, 39, 23, 23, 19, 20, 32, 35, 26, 20, 25, 26, 4, 29, 20, 26, 14, 19, 23
 - 12103 Gunton Dolomite, very dark gray to very dark brownishgray, very finely crystalline, fractured 8571-8573, very hard, dense, numerous very thin streaks and partings black shale, anhydrite on fracture planes, no show.
 - Dolomite, brownish-gray, very fine to finely crystalline, very hard, dense except for slight emoung poor vugular porosity 8582-8583, few hairline quarks veinlets with trace of secondary inter-crystalline porosity, slight H2S odor on fresh break, no show.
 - Dolomite, light brownish-gray to tan, micro-crystalline, very hard, dense, trace of incipient fracturing with anhy-drite on fracture planes, no show.
 - 2:0" Dolomite, medium gray, massive, fairly hard, dense, few dark gray shale partings, no show.
 - 2:0" Dolomite, light oromish-gray, very fine to finely crystalline, very hard, danse, trace of fracturing, few hairline white anhydrite veinlets, no show.
 - 1:6" Dolomite, very dark brownish-gray to black, massive to micro-crystalline, very hard and dense, no show.
 - 9:6" Dolomite, mottled light and medium brownish-gray and brown, very finely crystalline, very hard, dense, some incipient fracturing, rare black shale partings, few hairline vainlets quartz, slight H2S odor on fresh break, no show.

- 910" Dolomite, madium gray with dark gray bands, micro-crystalline, massive in thin streaks, very hard, dense, few hair-line quartz veinlets.
- 216" Anhydrite, very dark brownish-gray, massive to micro-crystalline, fairly hard, dense, slightly argillaceous, shele cleavage, dolomitic, no show.
- 3:0" Dolomite, light brown, with very thin dark gray streaks giving banded appearance, micro-crystalline, dense, vary hard, trace of incipient fracturing, no show.
- 1'6" Dolomite, light brown, micro to very finely crystalline, hard, dense, fractured with anhydrite crystals on fracture planes, scattered very small white anhydrite inclusions throughout, no show.
- Core No. 70 8622 86801, recovered 581
 - C.T. 20, 27, 22, 18, 18, 17, 16, 12, 21, 11, 16, 12, 12, 15, 15, 16, 16, 16, 15, 15, 15, 15, 15, 15, 35, 15, 18, 17, 10, 16, 25, 11, 11, 18, 13, 15, 14, 20, 11, 15, 17, 11, 21, 13, 19, 18, 15, 30, 26, 12, 17, 30, 26, 14, 15, 24, 24, 10
 - 4'0" Dolomite, dark gray to dark brownish-gray, very finely crystalline, very hard and dense, trace of fracturing and incipient fracturing, some color banding toward base, no show, slight H2S odor on fresh break.
 - 36:0" Stony Mountain Dolomite, madium to dark brownish-gray, very fine to finely crystalline, very hard, slight amount very poor spotty inter-crystalline porosity which looks wet, occasional prominent stylolitic partings, moderate amount incident fracturing throughout, some scattered very poorly devitrified pencil point vuggy porosity, no show, slight H2S oder on fresh break.
 - 5'0" Dolomite, gray to brownish-gray, very fine to finely crystalline, very hard and dense, fractured with anhydrite on fracture planes, slight H2S odor on fresh break, no show.
 - 12'0" Dolomite, banded medium and very dark gray, micro to very finely crystalline, very hard and dense, numerous very thin lenses black shaley dolomite, argillaceous in very thin streaks, alight H2S odor on fresh break, no show.
- Core No. 71 8580 8686; recovered 6: C.T. 8, 12, 25, 10, 12, 11
 - 6:0" Dolomite, dark brownish-gray, micro-crystalline, hard, dense, fractured 8680-8682 and 8685-86861, trace incipient fracturing throughout, no show.
- Core No. 72 8686 8737', recovered 51'

 C.T. 10, 9, 16, 18, 12, 10, 10, 11, 8, 9, 9, 9, 6, 6, 7:

 7, 7, 6, 8, 6, 6, 8, 11, 8, 8, 8, 7, 8, 7, 5, 7, 9; 8, 8, 9

 9, 14, 13, 10, 14, 9, 12, 8; 16, 16; 28, 15, 20, 30
 - 810" Dolomite, very dark gray, very finely crystalline, hard and dense, trace of incipient fracturing, very few white calcituding inclusions, very slight trace of black asohaltic residue, occasional streaks having numerous very thin lenses black shaley dolomite, no show.

- 27°0" Red River Dolomite, light gray to very light gray, very finely crystalline becoming occasionally micro-crystalline, poor scattered vuggy pencil point porosity, spotted to even very slight inter-crystalline porosity, moderate smount fracturing and incipient fracturing throughout, anhydrate crystals on fracture planes, dense in fay scots and thin streaks, slight HoS odor on fresh break, no show.
- loson limestone, medium to dark brownish-gray, very fine to finally crystalline, hard, slight trace poor pencil point vagular porosity, fairly well frectured vertical and diagonal, anhydrite crystals on fracture planes, dolomitic, slight calcitic, fairly strong HoS odor on fresh break.
- Cora No. 73 8737 8795, recovered
 - C.T. 11, 18, 18, 17, 17, 9, 10, 10, 6, 6, 8, 14, 12, 6, 7, 2, 8, 6, 5, 16, 4, 7, 9, 6, 9, 8, 12, 6, 8, 9, 7, 8, 6, 10, 10, 11, 12, 14, 19, 16, 10, 23, 9, 20, 15, 19, 13, 9, 13, 14, 12, 17, 15, 13, 13, 22, 22, 28
 - 3'0" Dolomite, medium to dark brownish-gray, hard, very fine to finely crystalline, slightly limey, argillaceous in part, some fracturing, no show.
 - 216" Dolomite, dark brownish gray, hard, dense, very finely crystalline, thin partings, soft white gypsum and gray anhydrite, no show.
 - 12:5" Gypsum, soft, white, crystalline, thin partings dark gray crystalline enhydrite becoming increasingly anhydritic toward base, no show.
 - 10:0" Limestone, dirty grzy-brown, hard, finely crystalline, dolomite, trace of inter-crystalline corosity in top, slightly wet in streaks, some tight fracturing with anhydrite crystals on fracture planes, no show.
 - 310" Limestone, light gray, medium hard, fine to medium crystalline, sucrose texture in part, very thin irregular dark gray shale partings, trace of inter-crystalline porosity which is wet in streaks.
 - 15:0" Limestone, medium to dark gray-brown, hard, dense, very finely crystalline, some calcite inclusions, thin veinlets white crystalline calcite, some fracturing toward base, no show.
 - 710" Dolomite, dark brown, with gray-brown mottling, finely crystalline, hard, very slight trace of inter-crystalline porceity, trace of fracturing with anhydrite crystals on fracture planes, numerous irregular inclusions gray massive chert, slight H₂S odor on fresh break, no show.
 - 5:0" Dolomite, very dark gray to brown, hard, dense, very finely crystalline, limey in part, appears anhydritic in part, argillaceous toward base with thin laminae black shale, no show.
- Core No. 74 8795 8846', recovered 51'
 - C.T. 8, 16, 11, 14, 9, 8, 7, 8, 7, 6, 7, 5, 11, 7, 6, 13, 8, 19, 7, 11, 13, 26, 15, 18, 14, 15, 14, 15, 20, 10, 16, 14, 15, 22, 27, 10, 16, 18, 24, 17, 18, 26, 20, 25, 20, 22, 30, 22, 15, 43, 25

- 610" Anhydrite, dark gray to black, very finely crystalline, medium hard, dense, verydolomitic in top with numerous laminae black dolomite, becoming purer anhydrite toward base, slight HoS eder on fresh break, no show.
- 7:0" Gypsum, white to very light gray, crystalline, soft, no show.

 10:0" Dolomite, light brown, massive, dense, shatters on impact,
 numerous recommented fractures, cemented with white anhydrite
 and gypsum, no show.
- Dolomite, brown, micro to very finely crystalline, hard, dense, trace of fracturing with numerous recemented fractures, numerous incipient fractures, anhydrite crystals on fracture planes with few quartz crystals, local concentration very small brown prismatic tourmaline crystals, shatters on impact, slight H2S odor, no show.
- 16'0" Dolomite, brownish-gray, micro to very finely crystalline, shatters and fractures on impact, dense, extremely broken horizontally, no show.
- 12'0" Dolomite, light brown, gray to grayish-brown, massive, dense, shatters on impact, extremely broken horizontally in upper hi, few fractures recmented with quartz, fractured in lower 8', no show.
 - 2º0° Dolomite, very dark brownish-gray, finely crystalline, extremely hard, dense, slightly fractured, few black stylolitic partings, very slight trace of very poor pencil point vugular porosity, no show.
- Core No. 75 8846 8874, recovered 19° C.T. - 9, 8, 6, 8, 6, 11, 5, 7, 6, 11, 4, 3, 6, 10, 6, 8, 8, 10, 9, 6, 9, 9, 11, 12, 9, 19, 40 (L.C.)
 - 7:0" Dolomite, dark brown to brownish-gray, very fine to finely crystalline, spotted even very slight inter-crystalline porosity with trace scattered poorly developed pencil point porosity, occasional inclusions white dolomite and analyderite, looks wet, slight HoS odor on fresh break, no show.
 - Dolomite, dark brownish-gray, very fine to medium crystalline, with very numerous large irregular inclusions and streaks clear crystalline anhydrite with good inter-crystalline porosity both in anhydrite and dolomite, porosity in anhydrite inclusions reaches proportions of being vugular, some dead oil staining, strong musty odor on fresh break, strong bitter taste, looks wet.
 - 6'6" Limestone, dark brownish-gray to brown, massive to microcrystalline with few scattered coarse crystals, dense, hard, fractured 8871'6"-6874', no show.
- Core No. 76 8875 89331, recovered 581
 - C.T. ~ 7, 8, 7, 9, 6, 5, 5, 7, 4, 5, 7, 8, 7, 8, 3, 6, 3, 8, 5, 7, 6, 7, 5, 7, 5, 7, 5, 6, 6, 7, 6, 4, 4, 4, 5, 5, 7, 6, 7, 5, 8, 6, 6, 6, 7, 6, 6, 6, 6, 5, 7, 8, 5, 5,
 - 30°0" Limestone, dark brownish-gray to brownish to gray, micro and finely crystalline in top becoming massive toward base, coarsely crystalline and fossiliferous bracks 8897-8898, fairly hard, dense, slight H2S odor on fresh break, no show.

- 190 Dolomite, light brownish-gray at top becoming dark brownish-gray at base, very finely crystalline in top becoming micro to very finely crystalline at base with numerous coarse crystals scattered throughout, limey at base, some tight fracturing, otherwise dense, scattered black stylolites, H2S odor on fresh break, no show.
- 24'0" Limestone, dark grayish brown to brownish gray, micro to very finely crystalline with few scattered medium to coarse crystals, fairly hard, dense, fractured 8909-8911' and 8926-8933, one coral found 8924, H2S odor on fresh break, no show.
- Core No. 77 8933 8992', recovered 59'
 - C.T. 3, 5, 10, 12, 15, 12, 14, 12, 8, 9, 13, 15, 14, 7, 9, 14, 15, 11, 13, 12, 11, 8, 16, 12, 14, 12, 10, 10, 7, 13, 12, 18, 12, 3, 3, 10, 6, 8, 12, 5, 10, 5, 5, 6, 7, 9, 8, 4, 6, 8, 6, 5, 5, 10, 6, 8, 6, 5, (1' error)
 - 25°0" Limestone, dark brownish-gray, micro to very finely crystalline, crystals poorly developed, medium hard, dense, very pronounced horizontal fracture, H2S odor on fresh break, no show.
 - 2710" Limestone, gray in top becoming brownish-gray toward base, very fine to finely crystalline, with fairly numerous medium to coarse crystals scattered throughout, extremely hard, dense, few black stylolites, very slight trace fracturing, H2S odor on fresh break, no show.
 - .600" Alternating limestone and dolomite, brownish-gray to gray, very fine to finely crystalline, with scattered coarse crystals, trace of poor pencil point vuggy porosity, dense in streaks, fractured in lower and upper 21, one honeycomb coral found at 89871, H2S odor on fresh break, all porosity looks wet, no show.
- Core No. 78 8992 90471, recovered 551
 - C.T. 7, 6, 5, 6, 5, 4, 7, 4, 10, 6, 6, 6, 8, 6, 6, 4, 7, 6, 5, 6, 7, 7, 5, 5, 6, 7, 6, 6, 4, 6, 5, 5, 4, 7, 6, 7, 6, 7, 6, 5, 5, 5, 7, 7, 6, 7, 5, 8, 20, 24
 - 8:0" Alternating dolomitic limestone and calcareous dolomite, brownish-gray, very fine to finely crystalline, spotty, very slight inter-crystalline porosity, few black stylolites, few incident fractures, some recemented fractures, H₂S coor on fresh break, looks wet, no show.
 - Limestone, brownish-gray, very fine to finely crystalline, very hard, dense, fractured 8917-8924, fractured and extremely broken 8929-8941, dolomitic in streaks, few black stylolites, HoS odor on fresh break, no show.
 - 6:0" Winnipeg Dolomite, dark steel gray, shiny, finely crystalline, extremely hard, dense, very calcareous streaks, very sandy throughout, approaching dolomitic sand, quartz grains fairly coarse, sub-rounded, some grains fracture on break, no show.

Core No. 79 9047 - 9055', recovered 8' G.T. - 31,62, 22, 30, 38, 67, 47, 50

200 Sand, light gray, fine to coarse grain, poorly assorted, fine grains angular, coarse grains sub-rounded, extremely hard, quartitic, tight, fractured, calcareous, some color banding showing, cross bedding, strong sulphur odor on fresh break, no show.

610" Sand, gray to very dark gray, fine grained, with few scattered coarse grains, angular, very hard, quartzitic, tight, fractured in upper 1'6", some fractures filled with milky quartz in lower 4'6" with trace of inter-crystalline porosity, very slightly pyritic, some irregular color banding, no show.

Core No. 80 9055 - 9059', recovered 3' C.T. - 62, 84, 89, 200

1º0" Sand, brownish-gray to dark gray, bended, fine grained, extremely hard, tight, quartzitic, trace tight fracturing, moderate amount very thin black streaks dolomite shale, with associated pyrites, sulphur odor on fresh break, no show.

136" Sand, very light gray to gray, banded, fine grained, glassy lustre, extremely hard, quartitic, dense, some fracturing, fairly numerous black very thin wavy argillaceous streaks, with associated pyrites, sulphur odor on fresh break.

O'6" Sand, very light gray to gray, banded, medium to coarse grain, very hard, quartzitic, dense, fairly numerous amount very small disc shaped gray shale fracturings, few partings and very thin streaks black shale with associated pyrites, sulphur odor on fresh break, no show.

Core No. 81 9059 - 9065', recovered 5' C.T. - 10, 10, 48, 37, 220, 335

2'0" Intermixed bended, light and dark gray sand and dolomitic shale, sand, very light gray to white, fine grained, very hard, tight, angular, with numerous fragments dark gray dolomitic shale scattered throughout, numerous very small masses pyrites, sulphur oder on fresh break, no show.

3:0" Quartzite, very light gray, finely crystalline, extremely hard, dense, few wavy dark gray argillaceous streaks giving banded appearance, sulphur odor on fresh break.

Core No. 82 9064 - 9088', recovered 24'
C.T. - 76, 183, 244, 360, 153, 66, 61, 90, 55, 83, 35, 46, 38,
45, 33, 45, 27, 47, 27, 28, 32, 37, 24, 25

Guartzite, very light buff gray, very fine to finely crystalline, extremely hard, dense except for few recemented fractures with trace inter-crystalline porosity which looks wet, pyritic in streaks, slight amount very dark gray to black irregular banding, sulphur odor on fresh break, no show. 516" Chartzite, gray-brown, very fine to finely crystalline, very hard, dense, with numerous wavy irregular laminas end very thin lenses very dark brown very hard shale, argillaceous throughout, pyritic, no show.

13'6" Shale, dark brownish-black to black, fairly hard in top, having excellent shale cleavage toward base, pyritic throughout, fossiliferous, (pelecy pods).

Core No. 83 9068 - 9102', recovered 14'

C.T. - 35, 42, 31, 35, 20, 34, 31, 39, 27, 25, 60, 191, 231 105

5'0" Shale, dark brownish-black to black, good shale cleavage, expressly broken and fractured.

6:6" Argillite, black, fairly hard, numerous very small rounded masses pyrites throughout, numerous concentration and scattered individually rounded medium sand grains, extremely broken and fractured except for bottom 1', no show.

2'6" - Winnipeg Sand - Quartzite, light buff to very light gray, banded, finely crystalline, extremely hard, dense, except for few recemented (calcite) fractures having trace of secondary inter-crystalline porosity, no show.

Core No. 84 9102 - 9108, recovered 6, C.T. - 50, 29, 54, 68, 99, 239

Ouartzite, white to very light gray, few irregular wavy very thin dark gray bands, finely crystalline, extremely hard, very slight porosity, no parmeability, strong sulphur odor on fresh break, slightly wet look, no show, moderate amount recemented (anhydrite) fractures with some intercrystalline porosity, looks wet.

Core No. 85 9108 - 9112, recovered li C.T. - 593, 16, 193, 191

4:0" Quartzite, white to very light gray, few irregular wavy very thin dark gray bands, finely crystalline, extremely hard, very slight porosity, no permeability, some recemented fractures (anhydrite cement), with some inter-crystalline porosity, all porosity looks wet, strong sulphur edor on fresh break, no show.

Core No. 86 9012 - 9020', recovered 8' C.T. - 130, 163, 50, 40, 69, 173, 131, 304

Quartzite, white to very light gray with few soots and wavy lamines dark gray, very fine to finely crystalline, extremely hard, dense except for few recemented fractures in upper 3° and some fairly good fracturing in lower 5° which has anhydrite crystals on fracture planes, strong pungent sulphur edor on fresh break, no show.

Core No. 87 9120 - 9121', recovered 6" C.T. - 298

- O'ó" Quartzite, very light gray, finely crystalline, extramely hard, dense, fractured with anhydrite crystals on fracture planes, strong pungant sulphur odor on fresh break, no show.
- Core No. 83 9121 9127', recovered 5' C.T. - 316, 260, 242, 255, 376, 504
 - Quartzite, very light gray, finely crystalline, extremely hard, dense, fractured with enhydrite crystals on fracture planes, strong pungent sulphur odor on fresh break, no show.
- Core No. 89 9127 9137, recovered 11, C.T. 40, 70, 35, 50, 77, 88, 138, 152, 255, 450
 - 11:0" Quartite, white, very light gray, very fine to finely crystalline, extremely hard, dense except for some tight fracturing with shhydrite on fracture planes, strong pungent sulphur odor, no show.
- Core No. 90 9137 9145', recovered 7'
 C.T. 15, 40, 40, 50, 95, 112, 356, 372
 - 7'0" Quartzite, white to very light gray, very fine to finely crystalline, extremely hard, dense except for some fairly well developed fracturing, and lense gray sandy pyritic argillite at 4140°, strong pungent sulphur cdor on fresh break, no show.
- Core No. 91 9145 ~ 9153', recovered 8'
 C.T. 60, 180, 182, 105, 238, 242, 165, 278
 - Quartzite, white, very fine to finely crystalline, extremely hard, dense to very slight porosity, no permeability, some tight fracturing, strong pungent sulphur odor on fresh break, no show.
 - Quartzite, very light buff to gray, very fine to finely crystalline, extremely hard, dense except for a trace very tight fracturing, some very thin dark gray irregular banding, slightly pyritic in bottom 6", strong pungent sulphur odor on fresh break, looks wet, questionable salty taste, no show.
- Core No. 92 9153 9154' NO RECOVERY
- Core No. 93 9154 9163', recovered 10' (picked up 1' of previous core) C.T. - 385, 73, 72, 92, 107, 171, 240, 150, 730
 - 4:0" Quartzite, very light buff gray, very fine to finely crystalline, extremely hard and dense; dark gray very thin irregular bands, strong oungent sulphur odor on fresh break, few recemented fractures, no show.
 - quartzite, very dark slight brownish-gray, very finely crystalline, extremely hard and dense except for few recemented fractures, some secondary inter-crystalline porosity in white dolomits cementing material, entire unit questionably slightly argillaceous, no show.

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Core Description Continued

•::

- O46" Quartzite, very dark gray to black, very hard, dense, executivemely argillaceous and shaley, no show.
- 1:0" Quartzite, very light buff to gray, finely crystalline, extremely hard, dense trace tight fracturing, no show.

T. D. SIM 9163

CORE ANALYSIS REPORT

CORE ANALYSIS REPORT

	.H. MURPHY JR. ET				
Freid Wi	ldcat	County Ro	ossvait	St.	ate Montana
Depth Feet	Permeability Millidarcys	Porosity Percent	Residual Sa Percent Por Oil		Probable Production
	Core No.	1 (2367-2375)) - GREENHORN	· · · · · · · · · · · · · · · · · · ·	
2368 2370 2372 2374	0.0 0.0 0.0 0.0	13.2 7.9 9.2 8.4	15.1 41.0 39.2 15.9	28.6 59.0 51.6 38.4	Nil 151 Nil Nil
	Core !	io. 2 (1,776-4	7861) - AMSDEN	<u> </u>	
4776.5 4777.5 4777.5 4779.5 4780.5 4781.5 4782.5 4783.5	0.0 0.0 0.0 0.0 0.0 0.0	4.0 6.1 1.6 1.7 4.1 2.6 2.2 2.0	0.0 0.0 0.0 0.0 12.0 0.0 0.0	38.2 19.8 60.4 17.7 30.1 37.2 44.5 38.8	Nil Nil Nil Nil Nil Nil
	Core No. 3	(5174-5184)) - KIBBEY SAI	<u>D</u>	
5174.5 5175.5 5176.5 5177.5 5178.5 5179.5 5180.5 5181.5 5182.5 5183.6	14.8 53.0 10.5 3.6 0.0 .1 .1 0.0	16.3 13.1 11.7 7.7 4.0 12.7 10.4 10.3 10.0 12.3	21.0 24.2 4.0 5.7 11.3 3.3 4.7 4.7 4.7 4.7	54.6 65.2 68.5 31.6 67.8 54.4 68.2 87.0 54.0 26.8	Cil Cil Water Water Mil Water Water Nil Mil
	Core No. L	ı (5184 <u>~</u> 5223¹) - KIBBEY SAI	<u>m</u>	•
5185.5 5186.5 5187.5 5188.5 5189.5 5190.5 5191.5 5192.5 5193.5 5194.5	29.7 33.4 72.0 129.0 143.0 18.9 0.0 0.0 23.1	16.3 13.3 17.9 18.8 20.3 20.3 11.9 6.5 7.1	0.0 0.0 0.0 0.0 0.0 0.0 0.0	70.4 55.2 87.8 87.6 69.7 67.1 93.4 68.7 68.3	Water Water Water Water Water Water Nil Mil Water

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Corre	Analucie	Report	Continued
COLG	11197122	uspor r	continued

Cepth	Permeability	Porosity	Residual S Percent Po		Probable
Feet	Millidarcys	Percent	Oil	Water	Production
	Co	re No. 4 - C	ontinued		
5195.5	0.0	5.0	0.0	100.0	Mil
5196.5	0.0	6.6	0.0	72.3	Nal
5197.5	0.0	3.lı	0.0	74.2	151
5,202.5	0.0	5.1	0.0	58.2	Ni.1
5203.5	1:01:	13.8	0.0	47.2	Watex
5204.5	0.0	9.2	0.0	42.9	Nil
5205.5	0.0	6.9	0.0	100.0	Nil
206.5	0.0	8.1	0.0	57.0	Mil
3207.5	0.0	3.8	0.0	49.3	Ni.l
5212.5	0.0	7•7	0.0	46.6	Nil
5213.5	0.0	ր.ր	0.0	71.3	Nil
321Ji°2	7.7	7.2	0.0	51.0	Water
5220.5	0.0	6.0	0.0	36.3	Wil
5221.5	J "Jt	8.8	0.0	36.6	Water
5222.5	0.0	7.9	0.0	35.0	MI
	Core 1	io. 5 (5582 - 5	(6921) - "B-3"		
5632.5	• 5	17.4	2.5	97.5	Water
5683.5	•1	20.3	7.7	92.1	NJ.1
5684.5	.3	17.6	0.0	67.7	Water
5685°2	0.0	12.8	0.0	100.0	. Mil
5686.5 5687.5	0.0	71° f	3.1	88.1	Nil
5683.5	0.0	15.3	.0.0	85.0	Nil
5689.5 -	0.0 ≟, 0.0	1.3 0.0	39.6 0.0	59∙5 0 . 0	Nil Nil
5690.5	0.0	5 . 5	0.0	81.4	Nil
691.5	0.0	4.4	0.0	75.9	Mil
	Core 1	10. 7 (5753 - 5	(8001) - "C-2"		
5795.5	0.0	1.1	47.6	. 40.5	N5.1
5796.5	0.0	1.8	25°5	. 74.8	MIL
797.5	0.0	4.8	10.2	35.8	Mil
5798.5	0.0	3.0	16.4	83.7	Wil
799.5	0.0	3.5	28.6	71.4	Nil
	Core No. 8	(5810~58181)	- MISSION CA	NYON	
5810.5	0.0	8.0	29.5	69.5	N5.1
5811.5	0.0	5.5	19.9	79.4	Nil
5812.5	0.0	5.8	18.8	64.0	Nil
5813.5	0.0	9.3	26.1	33.3	Mil
58บร	0.0	13.3	23.0	27.9	Mil
5915.5	0.0	10.6	29.5	29.5	Ni. 1.
5816.6	0.0	10.6	22.6	32.0	. Nil
5817.5	0.0	10.6	40.3	26.9	Nil

Coro	Analamic	Ennount	Continued
Core	Analysis	repert	Continued

3310	VOIS REDUCE CONTE	<u> </u>	Residual S	aturation	
Depth	Permeability	Porosity	Percent Po		Probable
Feet	Millidarcys	Percent	Cil	Water	Production
		4-40-10-10-1			
	Core No. 9	(5822-58301)	- MISSION CA	MXOM	
בממס ב	2.2		2.2	14 5	••••
5822.5	0.0	7.0	0.0	65.3	Nil
5823.5	0.0	8.6	0.0	35.9	Nil
5021.5	0.0	7.2	0.0	60.8	Mil
5825.5	0.0	7.1	0.0	45.6	Ni l
5826.5	0.0	له ٠ ل	0.0	43.0	Mil
5827.5	0.0	1.2	0.0	79.2	Mil
5828.5	0.0	5.1	0.0	47.3	W1
5829.5	0.0	4.8	25.0	С.ОД	Nil
	Core No. 10	(5830-58801)	- MISSION CA	NYON ·	
5830.5	0.0	7.2	0.0	33.0	Nil
5831.5	0.0	1.0	0.0	18.5	Nil
5832.5	0.0	4.6	0.0	35.8	Nil
5833.5	0.0	4.9	0.0	31,.2	Nil
5834.5	0.0	3.8	0.0	31.2	kil
5835.5	. 0.0	4.5	0.0	35.6	Mil
5835.5	0,0	5.4	0.0	47.0	Nil
5837.5	0.0	6.3	0.0	43.8	Ml
5838.5	0.0	6.9	0.0	30 . 5	Nil
5839.5	0.0	8.5	0.0	81.7	Nll
5840.5	0.0	3.8	0.0	25.1	Nil
5841.5	0.0	6.1	0.0	15.0	Mil
5842.5	0.0	2.5	0.0	30.1	Nil
5843.5	0.0	2.0	0.0	35.1	MII
5844.5	0.0	ل و ا	0.0	22.0	Ni.1
5845.5	0.0	3.0	0.0	22.7	Na.1
5846.5	0.0	2.7	0.0	25.9	1977
5847.5	0.0	3.3	0.0	0.0	Nil
5848.5	0.0	3.0	0.0	31.7	No. 1
5849.5	0.0	2.3	0.0	0.0	Nil
5850.5	0.0	4.3	0.0	0.0	Nil
5851.5	0.0	4.5	0.0	21.5	Mil
5852.5	0.0	6.3	0.0	11.4	Mil
5853.5	0.0	6.0	0.0	12.5	Mil
5854.5	0.0	2.4	0.0	31.4	Nil
5855.5	0.0	2.5	9.5	15.6	Nil
5856.5	0.0	7.2	18.8	27.9	Nil
5857.5	0.0	14.0	0.0	6.9	Mil .
5858.5	0.0	2.8	0.0	8 - ٢٠	W11
5859.5	0.0	1.3	0.0	99.8	Mil
5860.5	0.0	0.9	0.0	13.4	Nil
5861.5	0.0	1.0	. 0.0	76.7	Nil
5862.5	0.0	0.4	0.0	18.1	Mi
5863.5	0.0	1.2	0.0	0.0	76 <u>.</u> 2
5864.5	0.0	2.3	0.0	32.7	Nil
5865.5	0.0	0.7	0.0	13.7	Nil
5866.5	0.0	1.5	0.0	7.8.8	M1
5867.5	0.0	1.1	0.0	0.0	Mil
700,07	3,5				•

Cote wrat	Asia webout conti	nued	Residual Saturation			
Depth Feet	Permeability Millidarcys	Porosity Percent	Percent Po Oil	re Space Water	Probable Production	
	Cor	re No. 10 - C	ontinued			
5868.5	0.0	4.9	0,0	0.0	7 <u>= 1</u>	
5869.5	0.0	0.0	0.0	17.2	15.1	
5870.5	0.0	3.4	0.0	20.1	Mil	
5871.5	0.0	2.7	0.0	36.8	阿丁	
5872.5	0.0	2.1	0.0	47.9	随上	
5873.5	0.0	3.0	0.0	30.8	MI	
5374.5	0.0	3.6	0,0	يا. 19	Mil	
5875.5	0.0	2.5	0.0	33.3	Mil.	
5876.5	0.0	1.9	0.0	50.5	MI	
5877.5	0.0	1.5	0.0	46.9	Ni <u>1</u> N i 1	
5878.5 5879.5	0.0	2.0 2.0	0.0 0.0	48.6 49.7	Ni.1	
	Core No. 11	(5881-5900)	- MISSION CA	ANYON		
	0.0	2 2	0.0	42.0	Mil	
5881.5 5882.5	0.0	3.3 1.8	0:0	0.0	Nil	
5883.5	0.0 0.0	1.8	0.0	0.0	Nil	
5884.5	0.0	2.1	0.0	. 0.0	Nil	
5885.5	0.0	0.0	0.0	0.0	Nil	
5886.5	0.0	2.5	0.0	0.0	NE.1	
5887.5	0.0	3.8	34.5	51.8	Nil	
5888.5	0.0	5.5	19.8	19.8	NH. I	
5689.5	0.0	4.2	10.7	21.4	· Nil	
5890.5	0.0	3.0	15.7	0.0	Nil	
5891.5	0.0	3.7	0.0	0.0	Nil	
5892.5	0.0	2.2	0.0	0.0	Nil	
5893.5	0.0	3.7	0.0	24.5	Nil	
5894.5	0.0	5.7	0.0	16.4	Nil	
5895.5	0.0	1.5	0.0	0.0	Nil	
5896.5	0.0	1.9	0.0	0.0	Mil	
5897.5	0.0	3.7	0.0	0.0	Nil	
5898.5	0.0	2.9	0.0	24.2	Mil	
,	Core No. 12	(5900-59151) - MISSION C	иоуи а		
5900.5	0.0	4.7	21.9	26.3	Nil	
5901.5	0.0	2.6	18.3	55.0	Mil	
5902.5	0.0	2.5	18.4	74.0	Nil	
5903.5	0.0	1.5	0.0	52.6	Nil	
5904.5	0.0	3.2	0.0	29.4	Nil	
5905.5	0.0	1.7	0.0	56.5	Nil	
5906.5	0.0	3.6	0.0	25.0	Nal	
5907.5	0.0	2.3	48.5	48.5	Nil	
5908.5	0.0	2.0	60.5	39.5	Nil	
5909.5	0.0	1.2	36.0	63.0	Nil	
5910.5	0.0	1.1	0.0	84.7	Ni l	
5911.5	0.0	1.3	0.0	50.0	Mil	
5912.5	0.0	1.6	0.0	70.,6	. Nil	
-						

Core Analy	sis Report Conti	nued			
Depth Feat	Permeability Millidarcys	Porcsity Percent	Residual Sa Percent Por Oil		Probable -
	Cor	e No. 12 - C	cntinued		
5913.5 5914.5	0.0 0.0	2.2 1.9	0.0	51.0 41.3	M1 Nil
	Core No. 13	(5915-59261)	- MISSION CA	NYON	
5915.5 5916.5 5917.5 5918.5 5919.5 5920.5 5921.5 5922.5 5923.5	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	3.0 2.4 1.3 2.3 4.0 3.3 4.9 2.3 2.8	15.3 18.5 0.0 0.0 0.0 0.0 0.0 0.0	38.4 36.9 68.2 46.7 33.6 48.6 26.6 38.9 31.9 39.8	Nil Nil Nil Nil Nil Nil Nil
	Core No. 14	(5926-59361)	- MISSION CA	NYON .	
5926.5 5927.5 5928.5 5929.5 5930.5 5931.5 5932.5 5933.5 5934.5	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	2.0 2.4 2.0 2.3 1.7 2.3 1.1 2.2 2.8 2.9	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	26.9 29.5 39.3 50.5 82.7 76.8 61.5 97.0 30.2 28.3	Mil Mil Mil Mil Mil Mil Mil Mil
	Core No. 15	(5936-59601)	- MISSION CA	NYON	
5936.5 5937.5 5937.5 5938.5 5	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	1.0 1.7 1.1 2.0 2.0 1.6 1.0 1.1 1.8 1.6 2.6 1.2 2.7 1.1	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	86.0 44.0 68.2 64.0 97.5 75.5 41.7 97.4 97.8 91.5 91.9	Ni1 M1 M1 M1 M1 M1 M1 Ni1 Ni1 M1 M1

Core Analysis Report Continued

Depth Feet	Permeability Millidarcys	Porosity Percent	Residual Sa Percent Por Oil		Probable Production
	Coz	re No. 15 - Co	ontinued		
5953.5 5954.5 5955.5 5956.5 5957.5 5958.5	0.0 0.0 0.0 0.0 0.0	1.0 1.2 1.8 1.0 1.7	0.0 0.0 0.0 0.0	91.9 53.6 以1.3 89.9 以此.9 89.9	Mil Mil Mil Mil Mil
5959.5	0.0 Cora: No. 16	0.8 (5962-59951)	O.O - MISSION CAN	95.0 T70N	M1
5962.5 5963.5 5964.5 5965.5	0.0 0.0 0.0 0.0	1.7 1.4 2.0 2.3	0.0 0.0 0.0 0.0	47.5 42.0 50.6 42.6	Mil Nil Nil Nil
5971.5 5972.5 5973.5 5974.5	0.0 0.0 0.0 0.0	1.6 1.5 1.3 1.2	28.5 29.1 34.0 0.0	67.2 58.2 60.0 63.0	Nil Nil Mil Nil
	Core No. 18	(6009-60341)	- MISSION CA	ИОУИ	
6009.5 6010.5 6011.5	0.0 0.0 0.0	1.1 1.5 1.3	0.0 0.0 35.1	54.2 39.8 52.6	NE1 NI1 NI1
6014.5 6015.5 6016.5	0.0 1.9 0.1	1.1 5.1 2.5	0.0 33.6 59.5	52.3 12.7 25.4	N11 Cil
6018.5	1.7	4.3	47.5	28.4	Oil
	Core No. 19	(6034-60901)	- MISSION CA	NYON	
6075.5 6076.5 6077.5 6078.5	0.0 0.0 0.0 0.0	4.2 3.8 3.9 2.3	32.4 28.4 11.9 0.0	25.9 22.7 23.8 36.4	Mil Mil Mil Mil
6081.5 6082.5 6083.5 6084.5 6085.5 6086.5 6088.5 6088.5	0.0 0.0 0.0 0.0 0.0 0.0 0.0	3.0 4.8 5.0 4.9 3.6 4.2 3.6 3.7	37.6 21.8 23.1 25.6 28.4 38.6 32.2 38.5	22.5 23.2 15.4 17.1 18.9 52.2 21.4 25.7	Mil Nil Mil Mil Mil Mil Mil Mil

Depth Feet	Perme: Millio	bility	Porosity Percent	Residual S Percent Po Oil		Probable Production
) (6090-6:1 <u>1;</u> 5°)			
6090.5	:	1.8	6 . L	21.8	15.6	011
6096.5	(0.0	3 . 5	40.8	18.8	Nil
6097.5	(0.1	2.7	37.5	30.0	0 <u>1</u> 1
6098.5		0.2	2.9	50.0	35.0	Gil
6099.5		0.0	4.2	26.6	17.9	Nil
6100.5		0.1	8.3	18.3	10.5	Cil
6101.5		0.0	1.0	21.2	11.8	Mil
6102.5		2.4	6.1	24.2	22.3	0 <u>1</u> 1
6104.5	(0.0	2.4	49.5	45.0	Nil
6105.5		0.0	4.1	25.2	23.0	Mil
6110.5	(0.1	9.0	33.0	17.8	Oil
6111.5	(0.0	11.5	37.6	20.7	Ml
6112.5	(0.0	8.0	44.7	50.3	Mi
6113.5		0.0	3.1	46.6	50.2	Nil
6116.5	(0.0	4.2	37.8	با.30	MI
6118.5	(0.0	1.6	29.6	59.2	-NE1
6123.5		1.9	6.3	31.7	57.2	Oil
6124.5		0.0	9 .7 .	23 .!;	30.6	Mil
6125.5	(0.0	9•9	47•3	47.3	Nil
6126.5	(0.0	11.2	21.3	50.2	NH 1
6127.5	(0.0	16.0	8.4	44.7	Ni.1
6128.5	(0.0	8.7	13.5	15.8	<u>Ni 1</u>
6129.5		0.0	9.0	24.2	14.2	Nil
6130.5		0.0	11.3	20.6	72.1	MLI
6131.5		200	4.6	47.2	44.8	Cil
6132.5		ace	3.4	39.2	22.8	Ci.1
6133.5		0.0	5.6	38.5	19.3	Ni.1
6134.5		0.0	3.2	52.0	29.3	Mil
6135.5		0.0	2.0	20.3	30.4	NE.1
	Core	e No. 21	L (614,7∞6203°)	- MISSION C	ANYON .	
6147.5	(0.1	2.9	38.1	30.5	O <u>i 1</u>
6149.5		0.0	2.9	0.0	22.9	Mil
6151.5		0.2	4.7	31.4	19.5	Mil
6153.5		0.1	5.1	39.1	22.2	Nil
6155.5		0.1	7.1	25.1	37.3	Ni.1
6157.5		0.0	3.8	44.5	22.2	Nil
6159.5		∪°[†	3.8	35 . 1	35.1	Oil
6161.5		0.3	8.1	22.6	42.3	Oil
6163.5		1.0	9.9	24.3	53.1	Oil
6165.5		0.3	4.2	32.7	21.8	0il
رەرىد∪	,	ر₀∪	406	۱ ه عر	2100	

Core .	Anelvsis	Report	Continued
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Feet Millidarcys Percent Oil Water Production Core No. 21 - Continued 6167.5 Trace 2.7 46.3 37.9 Oil 6169.5 O.1 4.4 43.9 24.3 Oil 6171.5 O.1 6.5 18.4 19.0 Oil 6173.5 O.2 4.7 24.0 24.0 Oil 6175.5 O.9 4.6 28.4 21.3 Oil 6177.5 4.0 4.6 32.7 20.1 Oil 6179.5 O.4 5.6 23.6 13.8 Oil 6181.5 1.1 4.7 32.4 20.8 Oil 6183.5 O.3 4.1 11.0 22.0 Oil	Depth	Permeability	Porosi ty	Residual S		Probable	
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6171.5		Trace		46.3	37.•9	Oil	
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6173.5	6171.5	0.1	6.5	18.4			
6177.5 0.9 1.6 28.1 21.3 011 6177.5 1.0 1.6 32.7 20.1 011 6179.5 0.1 5.6 23.6 13.8 011 6183.5 0.3 1.1 11.0 22.0 011 6185.5 0.3 1.1 10.5 36.7 011 6185.5 0.3 1.1 10.5 36.7 011 6188.5 0.6 1.1 10.9 38.2 011 6189.5 0.6 1.3 10.9 38.2 011 6199.5 0.6 1.3 10.9 38.2 011 6199.5 0.6 8.5 13.3 13.3 011 6199.5 0.6 8.5 13.3 13.3 011 6199.5 0.6 8.5 13.3 13.3 011 6202.5 17.3 5.1 0.0 12.6 0.8 6202.5 17.3 5.1 0.0 15.6 0.8 6204.5 0.1 5.8 0.0 11.3 0.8 6206.5 0.1 5.8 0.0 11.3 0.8 6207.5 0.0 8.9 0.0 30.1 Will 6208.5 0.1 5.6 20.6 27.5 0.8 0.1 6211.5 0.9 3.5 0.0 63.0 0.8 6211.5 0.9 3.5 0.0 63.0 0.8 6211.5 0.9 3.5 0.0 63.0 0.8 6211.5 0.9 7.3 18.1 5.2 0.1 6222.5 0.5 6.1 6.6 13.2 0.5 6222.5 0.5 6.1 6.6 13.2 0.5 6221.5 0.5 6.1 6.6 13.2 0.5 6221.5 0.5 6.1 6.6 13.2 0.5 6221.5 0.5 6.1 6.6 13.2 0.5 6221.5 0.5 6.1 6.6 13.2 0.5 6221.5 0.0 2.1 0.0 0.0 Will 6250.5 0.0 2.1 0.0 0.0 Will 6260.5 0.0 2.1 0.0 0.0 Will 6270.5 0.0 2.9 0.0 0.0 Will 6270.5 0.0 2.9 0.0 0.0 Will 6270.5 0.0 2.3 0.0 30.1 Will 6285.5 0.0 2.3 0.0 30.1 Will 6290.5 0.0 1.5 0.0 0.0 0.0 Will 6290.5 0.0 2.3 0.0 30.1 Will 6290.5 0.0 2.3 0.0 30.1 Will 6290.5 0.0 2.3 0.0 28.9 Will 6306.5 0.0 2.3 0.0 28.9 Will 6306.5 0.0 2.3 0.0 28.9 Will 6307.5 0.0 2.4 (6311.6372) WISSION CANYON	6173.5	0.2	4.7	24.0			
6177.5	6175.5	0.9	4.6	28.4	21.3	Oil	
6183.5 0.3 0.3 0.1 11.0 22.0 011 6185.5 0.3 0.3 0.1 11.0 22.0 011 6185.5 0.3 0.3 0.1 10.5 36.7 011 6188.5 0.6 0.6 0.1 10.9 38.2 011 6192.5 0.6 0.6 0.8 513.3 13.3 011 6199.5 0.8 6202.5 17.3 5.1 0.0 15.6 Cas Core No. 22 (6203-6258*) - NISSION CANYON 6204.5 1.9 5.0 0.0 8.9 0.0 10.6 6206.5 0.1 5.8 0.0 11.3 6206.5 0.1 5.8 0.0 11.3 6206.5 0.1 620.5 0.1 5.8 0.0 11.3 6208.5 0.1 6208.5 0.1 5.8 0.0 11.3 6208.5 0.1 6210.5 0.3 6.9 13.5 18.9 628-011 6210.5 0.3 6211.5 0.9 3.5 0.0 63.0 622.5 0.9 3.5 0.0 623.0 623.0 623.0 624.5 0.9 7.3 18.1 52.2 611 6220.5 1.2 5.6 31.2 31.2 611 6220.5 1.2 5.6 31.2 31.2 611 6220.5 1.0 7.7 5.7 31.2 6221.5 0.0 0.0 Nil 6250.5 0.0 1.1 0.0 0.0 Nil 6265.5 0.0 2.1 0.0 0.0 Nil 6270.5 0.0 1.2 0.5 621.0 0.0 0.0 Nil 6250.5 0.0 1.1 0.0 0.0 Nil 6265.5 0.0 2.1 0.0 0.0 Nil 6275.5 0.0 2.1 0.0 0.0 Nil 6275.5 0.0 2.2 0.0 0.0 Nil 6275.5 0.0 2.3 0.0 0.0 Nil 6275.5 0.0 2.4 0.0 0.0 Nil 6275.5 0.0 2.9 0.0 0.0 Nil 6295.5 0.0 2.3 0.0 0.0 Nil 6295.5 0.0 0.0 0.0 Nil 6296.5 0.0 0.0 0.0 0.0 0.0 0.0 0.0) 1 • O	4.6	32.7		Oil	
6183.5 0.3 4.1 11.0 22.0 011 6185.5 0.3 4.1 10.5 36.7 011 6185.5 0.6 4.1 10.9 38.2 011 6192.5 0.6 4.8 29.9 29.9 011 6195.5 0.6 8.5 13.3 13.3 011 6195.5 0.6 8.5 13.3 13.3 011 6195.5 0.6 8.5 13.3 13.3 011 6202.5 17.3 5.4 0.0 15.6 Cas Core No. 22 (6203-62581) - NISSION CANYON 6204.5 0.4 5.8 0.0 14.3 Cas 6207.5 0.0 8.9 0.0 30.4 N1 6208.5 0.4 5.6 20.6 27.5 Cas 0210.5 0.3 6.9 13.5 18.9 Cas 0212.5 0.9 3.5 0.0 63.0 Cas 6214.5 0.9 7.3 18.4 52.2 01 6218.5 0.6 7.7 16.8 16.8 01 6220.5 1.2 5.6 31.2 31.2 01 6220.5 1.2 5.6 31.2 31.2 01 6221.5 0.9 7.7 5.7 34.2 Cas 01 6224.5 1.0 7.7 5.7 34.2 Cas 01 6224.5 1.0 7.7 5.7 34.2 Cas 01 6225.5 0.0 1.2 5.6 31.2 31.2 01 6226.5 0.0 2.9 0.0 10.1 N1 6265.5 0.0 2.9 0.0 10.1 N1 6270.5 0.0 2.9 0.0 10.1 N1 6280.5 0.0 2.9 0.0 10.1 N1 6280.5 0.0 2.3 0.0 30.4 N1 6295.5 0.0 2.3 0.0 30.4 N1 6300.5 0.0 2.3 0.0 28.9 N1 6300.5 0.0 2.3 0.0 0.0 N1 6316.5 0.7 3.1 0.0 MISSION CANYON	6179.5	با. ٥	5.6	23.6	13.8	011	
6185.5	6181.5	1.1	4.7	32.և			
6186.5	6183.5	0.3					
6188.5	6185.5						
6192.5 0.6 0.6 0.8 0.6 0.7 0.8 0.6 0.1 0.0 0.1 0.6 0.2 0.8 0.1 0.0 0.1 0.0 0.1 0.6 0.8 0.1 0.0 0.1 0.6 0.8 0.8 0.1 0.0 0.1 0.6 0.8 0.8 0.1 0.0 0.1 0.6 0.8 0.8 0.1 0.0 0.1 0.6 0.8 0.8 0.0 0.1 0.0 0.1 0.6 0.8 0.8 0.0 0.1 0.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0							
6195.5	6192.5						
6199.5					-		
Core No. 22 (6203-62581) - MISSION CANYON							
Core No. 22 (6203-62581) - MISSION CANYON							
6204.5	0202117	±1•2	7•4	0.0	1700	Cas	
6206.5		Core No. 22	(6203-62581)	- MISSION CA	ANYON	•	
6206.5	6201.5	1.9	5.0	0.0	16.6	Gas	
6207.5							
6208.5							
6210.5	6208.5						
6212.5	6270.5						
6214.5	6212.5						
6216.5 0.9 7.3 18.4 52.2 011 6218.5 0.6 7.7 16.8 16.8 011 6220.5 1.2 5.6 31.2 31.2 611 6222.5 0.5 6.4 6.6 13.2 Gas-011 6224.5 1.0 7.7 5.7 34.2 Gas-011 6224.5 0.0 1.1 0.0 0.0 N1 6260.5 0.0 1.1 0.0 0.0 N1 6265.5 0.0 2.4 0.0 0.0 N1 6270.5 0.0 1.2 0.0 0.0 N1 6270.5 0.0 2.9 0.0 40.1 N1 6280.5 0.0 2.9 0.0 40.1 N1 6280.5 0.0 2.3 0.0 30.4 N1 6280.5 0.0 2.3 0.0 30.4 N1 6290.5 0.0 1.5 0.0 46.2 N1 6290.5 0.0 3.3 0.0 53.4 N1 6290.5 0.0 3.3 0.0 53.4 N1 6300.5 0.0 2.3 0.0 28.9 N1 6300.5 0.0 3.6 0.0 28.9 N1 6300.5 0.0 3.6 0.0 0.0 N1 6310.5 0.0 3.6 0.0 0.0 N1 6310.5 0.0 3.6 0.0 0.0 N1							
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6220.5 6220.5 6220.5 0.5 6.4 6.6 13.2 Gas-Oil 6224.5 1.0 7.7 5.7 34.2 Gas-Oil 6260.5 0.0 1.1 0.0 0.0 Nil 6265.5 0.0 2.4 0.0 0.0 Nil 6275.5 0.0 2.9 0.0 1.2 0.0 0.0 Nil 6280.5 0.0 2.9 0.0 1.0 0.0 0.0 Nil 6280.5 0.0 2.9 0.0 1.0 6285.5 0.0 2.9 0.0 1.0 6285.5 0.0 2.3 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	6218-5						
6222.5 6224.5 1.0 7.7 5.7 34.2 Gas-Oil Core No. 23 (6258-6314) - MISSION CANYON 6260.5 0.0 1.1 0.0 0.0 Nil 6265.5 0.0 2.4 0.0 0.0 Nil 6270.5 0.0 2.9 0.0 1.0 0.0 Nil 6280.5 0.0 2.9 0.0 1.0 0.0 Nil 6280.5 0.0 2.9 0.0 1.0 0.0 Nil 6280.5 0.0 3.0 0.0 1.0 1.0 0.0 Nil 6285.5 0.0 3.0 0.0 1.0 1.0 0.0 1.0 1.0							
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6260.5 0.0 1.1 0.0 0.0 Nil 6265.5 0.0 2.4 0.0 0.0 Nil 6270.5 0.0 1.2 0.0 0.0 Nil 6275.5 0.0 2.9 0.0 40.1 Nil 6280.5 0.0 3.0 0.0 40.3 Nil 6280.5 0.0 2.3 0.0 30.4 Nil 6290.5 0.0 1.5 0.0 46.2 Nil 6290.5 0.0 3.3 0.0 53.4 Nil 6300.5 0.0 2.3 0.0 53.4 Nil 6300.5 0.0 2.3 0.0 28.9 Nil 6305.5 0.0 10.5 12.4 18.7 Nil 6310.5 0.0 3.6 0.0 0.0 Nil 6310.5 0.0 3.6 0.0 0.0 Nil		Coma No. 23	(K258 K21).1)	_ NISSION C	Y YLAUN		
6265.5		Gore No. 2)			ANTON		
6270.5 0.0 1.2 0.0 0.0 Nil 6275.5 0.0 2.9 0.0 40.1 Nil 6280.5 0.0 3.0 0.0 40.3 Nil 6285.5 0.0 2.3 0.0 30.4 Nil 6290.5 0.0 1.5 0.0 46.2 Nil 6295.5 0.0 3.3 0.0 53.4 Nil 6300.5 0.0 2.3 0.0 53.4 Nil 6305.5 0.0 10.5 12.4 18.7 Nil 6305.5 0.0 3.6 0.0 0.0 Nil 6310.5 0.0 3.6 0.0 Nil 6310.5 0.0 3.6 Nil 6310.5 0.0 3.6 Nil 6310.5 Nil	6260.5						
6275.5		0.0	2.4		0.0	Mil	
6280.5		0.0		0.0			
6285.5 0.0 2.3 0.0 30.4 Nil 6290.5 0.0 1.5 0.0 46.2 Nil 6295.5 0.0 3.3 0.0 53.4 Nil 6300.5 0.0 2.3 0.0 28.9 Nil 6305.5 0.0 10.5 12.4 18.7 Nil 6310.5 0.0 3.6 0.0 0.0 Nil Core No. 24 (6314-6372:) - MISSION CANYON 6316.5 0.7 3.1 0.0 46.1 Nil		0.0	2.9				
6290.5 0.0 1.5 0.0 46.2 M1 6295.5 0.0 3.3 0.0 53.4 M1 6300.5 0.0 2.3 0.0 28.9 M1 6305.5 0.0 10.5 12.4 18.7 M1 6310.5 0.0 3.6 0.0 0.0 M1 Core No. 24 (6314-6372:) - MISSION CANYON 6316.5 0.7 3.1 0.0 46.1 Nil		0.0	3.0	0.0	40.3	Ni:1	
6295.5 0.0 3.3 0.0 53.4 M11 6300.5 0.0 2.3 0.0 28.9 M11 6305.5 0.0 10.5 12.4 18.7 M11 6330.5 0.0 3.6 0.0 0.0 M11 Core No. 24 (6314-6372:) - MISSION CANYON 6316.5 0.7 3.1 0.0 46.1 Nil		0.0	2.3	0.0	30.4	Mil	
6300.5 0.0 2.3 0.0 28.9 Mil 6305.5 0.0 10.5 12.4 18.7 Mil 6310.5 0.0 3.6 0.0 0.0 Mil Core No. 24 (6314-6372:) - MISSION CANYON 6316.5 0.7 3.1 0.0 46.1 Nil		0.0	1.5	0.0	46.2	Mil	
6300.5 0.0 2.3 0.0 28.9 Mil 6305.5 0.0 10.5 12.4 18.7 Mil 6310.5 0.0 3.6 0.0 0.0 Mil Core No. 24 (6314-6372:) - MISSION CANYON 6316.5 0.7 3.1 0.0 46.1 Nil				.0.0	53.4		
6305.5 0.0 10.5 12.4 18.7 Mil 6330.5 0.0 3.6 0.0 0.0 Mil Core No. 24 (6314-6372:) - MISSION CANYON 6316.5 0.7 3.1 0.0 46.1 Nil	6300.5			0.0		Mil	
Core No. 24 (6314-6372:) - MISSION CANYON 6316.5 0.7 3.1 0.0 46.1 Nil	6305.5	0.0	10.5	12.4	18.7	Mil	
6316.5 0.7 3.1 0.0 46.1 Nil	633.0.5	0.0	3.6	0.0	0.0	MI	
		Core No. 24	(6314~6372;)	- MISSION C	ANYON		
	6336 E	0.7	2 7	0.0	1.6.7	Ni 7	
-,,-							
	-,	11896) . c		2700		

Core	Analweig	Report	Continued
OOTG	WISTARE	renort	CONTINUE

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Depth	Permeability	Porcsity	Residual S Percent Po		Probable
Feet	Millidarcys	Percent	011	Water	Production
	Cor	⊖ No. 24 - C	ontinued		
6325.5	0.0	2.3	0.0	41.3	Nil
6329 . 5	0.0	2.2	0.0	44.3	Mil
6334.5	0.6	6.5	0.0	29.0	Nil
6339.5	0.0	2.8	0.0	38.5	M1
63445	0.0	2.0	0.0	48.0	Nil
6349.5	0.0	5.2	0.0	32.2	Nil
6354.5	0.0	3.1	0.0	44.7	Nil
6359.5	0.0	2.0	0.0	52.6	Ni.1
6364.5	0.0	3.8	29.8	35.7	MIJ
6369.5	Trace	12.6	3.8	37.8	MI
	Core No. 25	(6372-64301)	- MISSION CA	NYON	
6372.5	0.0	4.4	0.0	0.0	Nil
6375.5	0.0	1.9	0.0	42.5	Ni l
6380.5	0.0	5.0	0.0	18.0	Mil
6385.5	0.0	4.5	0.0	20.4	Nil
6390.5	0.0	3.3	0.0	27.0	Mil
6395.5	0.0	1.9	0.0	70.2	Mil
6100.5	0.0	1.6	0.0	35.9	Nil
6405.5	0.0	2.2	0.0	0.0	NE 1
61:10.5	0.0	3.2	0.0	27.8	Nil
6420.5	0.0	4.5	0.0	15.8	Nil Nil
6425.5	0.0 0.0	0.9 2.0	0.0	0°0 34°6	Nil
• • • •	Core No. 25	(6£30-6£88°)	- MISSION CA	NYON	
6430.5	0.0	6.5	0.0	10.1	Nil
61,35.5	0.0	0.0	0.0	0.0	Mil
6140°2	0.0	0.0	0.0	0.0	Mi
6445.5	0.0	0.0	0.0	0.0	Nil
6450.5	0.0	1.3	0.0	0.0	Mil
6455.5	0.0	1.3	0.0	0.0	Nã. l
6460.5	0.0	0.0	0.0	0.0	Nil
6465.5	0.0	5.0	0.0	16.9	Nil
6470.5	0.0	0.0	0.0	0.0	Nil
6년75.5	0.0	4.5	0.0	0.0	Ni. 1
6480.5	0.0	0.0	0.0	0.0	Nil
6485.5	0.0	0.0	0.0	0.0	NTI
	Core lic. 27	(6488-65281)	- MISSION CA	NOYN	
6490.5	0.0	0.0	0.0	0.0	Ml
6495.5	0.0	0.0	0.0	0.0	ИïЛ
6500.5	0.0	0.0	0.0	0.0	Nil
6505.5	0.0	0.0	0.0	0.0	Nil
6510.5	0.0	0.0	0.0	0.0	Nil
6515.5	0.0	0.0	0.0	0.0	Mil
6520.5	0.0	0.0	0.0	0.0	· ral
6525.5	0.0	0.0	0.0	0.0	Mil

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Depth Fest	Permeability Millidarcys	Porosity Percent	Residual S Percent Po Oil		Probable Production
	Core No. 28	(6530-65881)	- MISSION C	NYON	
6530.5	0.0	0.0	0.0	0.0	Mil
6535.5	0.0	0.0	0.0	0.0	Nil
6540.5	0.0	0.0	0.0	0.0	Mil
6545.5	0.0	0.0	0.0	0.0	Nil
6550.5	0.0	0.0	0.0	0.0	Nil
6555.5	0.0	0.0	0.0	0.0	Mi
6560.5	0.0	0.0	0.0	0.0	Nil
6565.5	0.0	0.0	0.0	0.0	NTJ
		LODGEPOLE	₹.		
6570.5	0.0	0.0	0.0	0.0	N11
6575.5	0.0	0.0	0.0	0.0	Nil
6580.5	0.0	0.0	0.0	0.0	Nil
6585.5	0.0	0.0	0.0	0.0	Nil
	Core No.	29 (6588=66 <u>4</u> 6	S') - LODGEP	OLE	
6588.5	0.0	0.0	0.0	0.0	NE.1
6593.5	0.0	0.0	0.0	0.0	Nil
6598.5	0.0	0.0	0.0	0.0	Mil
6603.5	0*0	0.0	0.0	0.0	Mil
6608.5	ე.0	0.0	0.0	0.0	MI
6613.5	0.0	0.0	0.0	0.0	Nil
6618.5	0.0	0.0	0.0	0.0	Nil
6623.5	0.0	0.0	0.0	0.0	Nil
6528.5	0.0	. 0.0	0.0	0.0	NL1
6633.5	0.0	0.0	0.0	0.0	Nä l
6638.5					Nil
6643.5	0.0 0.0	0.0 0.0	0.0 0.0	0 . 0	Nil
	Core No.	30 (6646-670)	¹¹) ∞ LODGEP	OLE	
6646.5	0.0	0.0	0.0	0.0	Nil
6656.5	0.0	0.0	0.0	0.0	Nil
6665.5	0.0	0.0	. 0.0	0.0	Nil
6676.5	0.0	0.0	0.0	0.0	Nil
6666.5	0.0	0.0	0.0	0.0	Nil
5696.5	0.0	0.0	0.0	0.0	MI
	Core No.	31 (6704-6762	2') - LODGEP	<u>OLE</u>	
6704.5	0.0	0.0	0.0	0.0	MI
6714.5	0.0	0.0	0.0	0.0	Mil
6724.5	0.0	0.0	0.0	0.0	Nil
6734.5	0.0	0.0	0.0	0.0	Mil
6744.5	0.0	0.0	0.0	0.0	Nil
6754.5	0.0	0.0	0.0	0.0	Nil

Core .	Analvais	Report	Continued
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	tydib report Conc.		Residual Sa		
Depth Fest	Permeability Millidarcys	Porosity Percent	Percent Por Oil	re Space Water	Probable.
	ratificate cys	Tercens	<u>urr</u>	Water	Production
	Core No.	32 (6762-682	11) - LODGEPOI	Œ	
6764.5	0.0	0.0	0.0	0.0	Nil
6774.5	0.0	0.0	0.0	0.0	Nil
6784.5	0.0	0.0	0.0	0.0	
679ls.5	0.0	0.0			Nil
6804.5			0.0	0.0	131.
	0.0	0.0	0.0	0.0	Nil
6814.5	0.0	0.0	٥.٥	0.0	Nil
	Core Nc.	33 (6821-687	9') - LODGEPOI	<u>ue</u>	
6824.5	0.0	0.0	0.0	0.0	Nil
683L.5	0.0	. 0.0	0.0	0.0	MI
6844.5	0.0	0.0	0.0	0.0	. Mil
6854.5	0.0	0.0	0.0	0.0	Nil
5854.5	0.0	0.0	. 0.0	0.0	NE 1
6874.5	0.0	0.0	0.0	0.0	NEI NEI
			7') - LODGEPOI		
4001 -					
6884: -5	0.0	0.0	0.0	0.0	NLl
5894.5	0.0	0.0	0.0	0.0	Mil
6904.5	0.0	0.0	0.0	0.0	Nil
5914.5	0.0	0.0	0.0	0.0	Mil
5924.5	0.0	0.0	0.0	0.0	Ni.1
6934.5	0.0	0.0	0.0	0.0	Nil
	Core No.	35 (6937-699	5') - LODGEPOI	<u>LE</u>	
6946.5	0.0	0.0	0.0	_	192 T
6959.5			0.0	0.0	Ni l
	0.0	0.0	0.0	0.0	Nil
२७६५.5	0.0	0.0	0.0	0.0	Nil
5969.5	0.0	0.0	0.0	0.0	Ni.1
6974.5	00	0.0	0.0	0.0	NLI
6979.5	0.0	0.0	0.0	0.0	Mal
6984.5	0.0	0.0	0.0	0.0	Ml
6989.5	0.0	0.0	0.0	0.0	Nil
5994.5	0.0	0.0	0.0	0.0	MI
	Core No.	36 (6995-703	51) -LODGEPOLI	<u> </u>	
6999.5	0.0	0.0	0.0	0.0	Ni.1
7009.5	0.0	0.0	0.0	0.0	Ni 1
7019.5	0.0	0.0	0.0	0.0	Nil
7029.5	0.0	0.0	0.0	0.0	Ni 1
			51) - LODGEPO		
7035.5	0.0	0.0	0.0	 0 . 0	Ml
	0.0	0.0	0.0		
7045.5	0.0	0.0	0.0	0.0	Mil
7055.5	0.0	0.0	0.0	0.0	MI
7065.5	0.0	0.0	0.0	0.0	. Wel

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Depth	Permeability	Porceity	Residual Sa Percent Pos	aturation	Probable
Feet	Millidarcys	Percent	Oil	re Space Water	Probablo Production
	Core No	. 41 (7252~7)	310 - BAKKEN		
7291.5	0.0	0.0	0.0	0.0	15.1
	Core No.	15 (7400-74)	58°) - DUPERO	4	
7455-58	0.0	<u>12.5</u> ·	ħ°0	7.1	%1
	Core No.	1,6 (7458-75)	16') - DUPERC	<u> </u>	
7456.5	0.0	11.9	4.3	8.6	MI
7460.5	0.0	10.8	4.7	1.1.3	Ni.1.
7462.5	0.0	10.3	4.7	9.4	Ni.1
	Core No.	L7 (7516-75)	57°) - DUPERO	<u></u>	
7526-20	0.0	5.1	11.3	22.6	M.l .
7520~25	0.0	6.4	0.0	75.8	M1
7525-30	0.0	5.5	8.4	23.0	Mil
7535-40 7540-45	0.1	6.3	6.9	145.2	<u>'111 </u>
7545-50	0.0	2 .lı . 3 .9	0 . 0	46.3 43.9	14.1 17.7
7550-57	0.0	. 3.9 2.5	0.0 18.6	43.9 55.8	m1 M1
	Core No.	<u>49 (7599-769</u>	57') - PUPERO	<u>N</u>	
76 52. 5	0.0	2.8	18.2	- 5!; . 6	Mi
7653.5	0.0	3.2	15.1,	62.4	Nil
	Core lio.	50 (7659-77	17) - DUPERON		
7677.5	0.0	يا. 2	0.0	0.0	16.1
7632.5	0.0	3.8	O°C	36.1	Nil
7687.5	0.0	6.9	5.8	31.6	Mil
7692.5	0.7	9.4	0.0	9.5	ra 1
7697.5 7702.5	0.0	4.6	10.4	20.8	N.I
77.11.5	0.0 0.0	5.4	0.0	16.6	N2]
7716.5	0.0	5.7 3.4	8.3 12.7	20.7 0.0	M1 M1
	Core No. 56	(8010-8058)) - DAWSON BA	Ÿ	
3051,25	10.7	5.1	0.3	- 22 _° 5	C: 3
8059.5	0.0	2.4	9.1 0.0	37.9	Oil Mil
	Core No. 62	(8336-8 356 1)	- SIL, IMTER	LAKE	
8336,5	0.0	5.4	0.0	36.1	MI
8314.5	0.0	4.9	0.0	25.8	ral
831,5.6	0.0	6.1	0.0	39.3	Nil
8349.5	0.0	3.8	0.0	31.6	Nil
		•			•

name in	D	D	Residual S		
Depth Feet	Permeability Millidarcys	Porosity Percent	Percent Po Oil	re Space Water	Probable Production
	Core No. 63	(8356-84061)	- SIL. INTE	RLAKE	
3360.5					
	0.0	3.3	0.0	21.8	Nil
8370.5	0.0	1.9	0.0	32.1	Nil
8380,5	0.0	0.0	0.0	0.0	Mil
8390.5	0.0	0.0	0.0	0.0	Nil
31,co.5	0.0	0.0	0.0	0.0	Nil
	Core No. 64	(8706-8773)	SIL. INTER	LAKE	
81,09.5	0.0	3.2	0.0	22.5	Mil
81,15.5	0.0	2.2	0.0	33.7	Mil
	Core No. 65	(8 <u>119-81771)</u>	- SIL. INTER	LAKE	
81,29.5	0.0	0.0	0.0	0.0.	Ml
8429.5	0.0	0.0	0.0	0.0	Ni.1
8439.5	0.0	0.0	0.0	0.0	NLI
81419.5	0.0	0.0	0 3 0	0.0	Ni.1
8459.5	0.0	0.0	0.0	0.0	
8793°2					Nil
	0.0	0,0	0.0	0.0	ra 1
3476.5	0.0	0.0	0.0	0.0	Nā.l
	Core No. 66	(8477 <u>-85351)</u> .	SIL. INTER	TVKE	
8487.5	0.0	0.0	0.0	0.0 .	MI
8497.5	0.0	0.0	0.0	0.0	Mil
8507.5	0.0	0.0	0.0	0.0	Nil
8517.5	0.0	3.9	0.0	38.5	Ni.1
B527.5	0.0	0.0	0.0	0.0	Nil
	Core No.	70 (8622-868	0º) - GRENTO	N	
8634.5	0,0	1.1	0.0	56.2	Nil
8643,5	0.0	1.3	0.0	0.0	N±1
8654.5	0.0	1.1	0.0	0.0	Nil
8659.5	0.0	1.2	0.0	53.4	Nil
	Core No. 72	(8666-87371)	⇒ ORD. RED R	IVER	
8695.5	0.0	5.7	0.0	26.4	Mīl
8700.5	0.0	4.6	0.0	25.5	Nil
8705.5					
	0.0	6,6	0.0	19.1	Ml
8710.5	0.0	7.3	0.0	17.3	Mil
8715.5	0.0	6.6	0.0	16.8	Mil
	Core No. 75	(8846~88731)	- ORD. RED R	IVER	
8847.5	0.0	7.1	0.0	26.8	ra 1
8849.5	0.0	4.5	0.0	81.lı	Mil
8851.5	3.9	3.0	0.0	100.0	Water

Core	Analysis	Report	Continued
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Depth	Fermea'd lity	Porosity	Percent Pos	re Space	Probable
Feet	Millidercys	Percent	ਕ1	Water	Production
	Coz	re No. 75 - Co	mtinued		
8853.5	4.4	5.5	0.0	33.7	Water
8855.5	23.0	8.2	0.0	100.0	Water
8857.5	23.0	9.9	0.0	100.0	Water
	Core No. 79	9 (9047-9055)) - ORD. RED	RIVER	
9047.5	1.1	با، 2	0.0	0.0	Ml
9049.5	0°0	3.6	0.0	0.0	Mil
9051.5	0.0	1.0	0.0	J00°0	NTI
9053.5	0.0	1.9	0.0	43.7	ìāl
	Core No. 81	. (9102~9109°) - WINNEPEG	SAND	
9103.5	0.0	3.0	0.0	0.0	Ml
9105.5	0.0	0.0	0.0	0.0	Ni 1
9107.5	0.0	2.3	0.0	0.0	Nil
	Core No. 88	3 (9121-9127)) - WINNEPEG	SAND	
9122.5	0.9	1.7	0.0	0.0	MI
9125.5	0.0	2.4	0.0	0.0	NL 1
	Core No. 89	9 (9127-9137)) - WINNEPEC	SAND	
9127.5	0.0	1.3	0.0	45.7	M.l
9129.5	0,0	2.3	0.0	31.7	Nil
9131.5	0.0	1.7	0.0	0.0	MI
9133.5	0.0	1.3	0.0	52.4	18.1
9135.5	0.0	1.5	0.0	0.0	Nil
	Cora No. 9	1 (9146-91531) - WINNEPEG	SAND	
9146-48	0.0	2.3	0.0	42.5	MI
9148-50	0.0	1.8	0.0	80.0	Nil
9150-52	0.0	2.9	0.0	25.0	Nil
9152-54	0.0	3.3	0.0	0.0	Nil

Company	C.H.1	मान प्रमय हो।	R. ET.A	L		Locat	lies		<u></u>	:	Fii	· ·	•	
wan FA	ST POPLAT	 R UNIT #							:	•	· ·			75
: ' :		CONT				Lege			2. .				ng	- 1
Field_W	TLDCAT	· ·	· <u>Vi</u>	3.4.5	Ş.,		Shale			<u>· · · · · · · · · · · · · · · · · · · </u>	 		nit	1.0
	ROOSEVEL	p.	M	ONTANA.		_	•					# <u></u>	(518)	4-522
County_	TOCOB VED	.*	State	ONTAKA	· · · · · · · · · · · · · · · · · · ·	Rema	irks CORE #	•)#2(41	10-41	361)#3	<u> 1)517</u>	4-518
Drilling	Depth	Permeability		Residuel S	aturation ore Space	Probable	1100 75	sbilitý, Má , 50		•		saturat		
Time : Min/FL	Peet	Millidareye				Production		osity 7 _c . 20 1		•	Oil sat	uration, :::25	. % Fo	ore
		:							ĬIIII		ıή	TITT	Ť	
				Çerir						•				
	2368	0.0	13.2	15.1	28.6	Nil'	┨┠╬┌┼╁┼	†	 	_2367			╁┼┼	+++++
				\$ 11.67 P		· :							址	
	2370 .	0.0	7.9	41.0	59.0	Nil	╽┝╁┼╍╂╌		╂╬┼┼┼╋					
	2372	0.0	9.2	39.2	51.6	Nil				3.3 ·				/
	2374					,,,,	111111						N/	
İ	2314	0.0	0.4	15.9	38.4	Nil	i }};;;;		 	· . -2375 -			4	
					: <u>}</u>					~ CIC> -				
		.	<i>.</i>	1.00		1		• • • • • • • • • • • • • • • • • • • •	++++		-	++++	╀┼┼┼	++++
٠ ،		<u> </u>			· .					<u> </u>			1111	
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	4776.5	0:0	4.0	0.0	38.2	NIL		 	11116	4776 -		+++++	1	!
	4777.5	0.0	6.1	0.0	19.8	11				_	聞			
<u> </u>	4778.5	0.0	1.6 1.7	0.0	60.4	n			11113				 	쒸내
. ·	4780.5	0.0	4.1	12.0		п			1116					
	4781.5	0.0	2.6	0.0	37.2	17		┊┇┋┋┋	11119					
	4782.5	0.0	2.2	0.0	38.8	11			11111				0	11111
									Щ				\prod	Ш
	 					-			╂┼┼┼┼	_4786 _		╁╂╁╂		+++
]	1								· · ~~~			1'11	
	5174.5	44.8	16.3	21.0	54.6	Oil	####	8	╎╎╎╎ ╏	-5174-			++++	
	5175.5	53.0	13.1	24.2	65.2	, "	mini	Ø .		e: •			<u> </u>	
	5176.5 5177.5	10.5 3.6	11.7	4.0	68.5 31.6	Water"		- 	Q					H
	5178.5	0.0	4.0	5.7	67.8) 0 0	***	₩.
	5179.5 5180.5	•4	12.7	3.3	54.4	Water					1		Ш	•
	5181.5	•l4 •1	10.4	4.7	68.2 67.0							$\frac{1}{1}$		
	5182.5	0.0	10.0	4.7	54.0					i			世	
	5183.5	.1	12.3	3.8	26.8	7	+++++			-5184-		pr	#	
7.5	5185.5	29.7	16.3	0.0	70:4	Water			∤┼┼┼			1++++	+++	
	5186.5	33.4	13.3	0.0	55.2	Ħ		Ö	ЩЩ	•			Щ	ĺ
	5187.5 5188.5	72.0 129.0	17.9 13.8	0.0	87.8	11			 			++++	++}	
	بر.	+c 7.0	10.0	0.0.	87.6	<u> </u>] [耳	ſ

THE HYCALOG COMPANY .

CORE ANALYSIS REFORT

Company.	C. H. MU	RPHY JR.	ET. A	<u> </u>		Locat	irc	Pile :
Well	EAST POP	LAR UNIT	r#1			.	Sand C. TO	Eng
Field	WILDCAT		•			Lege	d: Shrie Cene	
		•			·		Line . Hill	L'nit
County	ROOSEVEL	<u>T</u> .	State_	MONTAL	NA	Rema	:kx CORE # L (CONTINUED)	<u> </u>
Drilling	Depth	Permeability		Residual S Percent Pe	g		100 75 50 25 0	Water saturation, % Pore O
Time Min/FL	Post .	Millidareye	Percent .	Oil .	Water	Production	Formity 7	Oil saturation; % Pore ************************************
	5189.5 5190.5 5191.5 5192.5 5193.5	143.0 18.9 18.9 0.0	20.3 20.3 11.9 6.5 7.1	0.0	69.7 67.1 .93.4 68.7 68.3	NIL	5194	
	5194.5 5195.5 5196.5 5197.5	23.1 0.0 0.0 0.0	13.0 5.0 6.6 3.4	0.0	62.1 100.0 72.3 74.2	1 "	519L	
	5202.5 5203.5 5204.5 5205.5 5206.5 5207.5	0.0 0.0 0.0 7.7	13.8 9.2	0.0	47.2	"		
	5212.5 5213.5 5214.5	0.0 0.0 7.7		0.0	71.3	NIL "Water		
	5220.5	0.0	6.0	0.0	36.3	NIL	5220	
	5221.5 5222.5	0.0	8.8 7.9	0.0	35:0	Water	522	3
e de				Venezya e 1,776., *1,7° a e la Espans de univenez describantes venez	Andread and the second of the	مولة عناة والإداعات الإدامات الدورات الدورة المراجعة المتعدد ا		

: Company C. H. MURPHY JR. ET. AL. EAST POPLAR UNIT # 1 ·Well_ Legend: Sund Dolomite. Shale Anhydrite ... CAX WILDCAT Field_ Lime ... Firmy ROOSEVELT _State_MONTANA Remarks CORE # 5 (5682-56921) #7 (5753-58001) County_ Permeability, Md.C Water saturation, % Pore O-Drilling 50 , Depth Permeability Porosity Percent Pore Space Oil saturation, % Pore Time Feet Millidarcys Min/FL Percent Water 10.5 5682 17.4 2.5 20.3 7.7 5682:5 97.5 Water 5683.5 .l ..92.1 Nil 5684.5 17.6 0.0 67.7 5، Water 5685.5 12.8 0.0 0.0 NIL 5686.5 0.0 14.4 13.1 88.1 15.3 0.0 85.0 1.3 89.6 59.5 0.0 0.0 0.0 5687.5 .1 5688.5 0.0 NIL 5689.5 0.0 n. 5690.5 5.5 0.0 81.4 n ' 0.0 5691.5 4.4 0.0 0.0 5692 5753 5760

lompany.	С. н. м	RPHY JR	ET. A	L:		Locatio	on	File		·
₩ell	EAST POI	PLAR UNI	т#1			Legeno	Sand Dolomite		•	
Field	•	:				;	Shale Anhydrite.	· ·	Unit	
Jounty			State_			Remar	Lime CORE #7 (Cont)#8 (5810-5	818')#9 (330')
Drilling Time Min/FL	Depth Feet	Permeability Millidarcys		Residual B Persent Po Oil	0 1	Probable Production	Permeability, Md.O 0 100 75 50 25 0 Porosity %	Oil saturat		Pore 0 0
_							5780			
·.	5795.5 5796.5 5797.5 5798.5 5799.5	0.0	1.1 1.8 4.8 3.0 3.5	10.2	40.5 74.8 35.8 83.7 71.h	Nil "" ""	5800			Ø
	5010.5 5811.5 5812.5 5813.5 5814.5 5815.5 5016.5 5817.5	0.0	8.0 5.5 5.8 9.3 13.3 10.6 10.6	18.8 26.1 23.0 29.5 22.6	69.5 79.4 64.0 33.3 27.9 29.5 32.0 26.9	Nil n n n n n	5810			
	5822.5 5823.5 5824.5 5825.5 5826.5 5827.5 5826.5 5829.5	0.0 0.0 0.0 0.0 0.0 0.0	7.0 8.6 7.2 7.1 4.4 1.2 5.1	0.0 0.0 0.0 0.0 0.0 0.0 25.0	65.3 35.9 60.8 45.6 43.0 79.2 47.3	, ,	5822			8

Company	С. н.	MURPHY J	R. FT.	AL.		Locati	on		File _		·
Well	EAST P	OPLAR UN	IT # 1	· 		Legen	Sand			Eng	
Field.							Shale			Unit	
r içiu,							Lime			On:t	
County_	- 		State_			Remai	ks Core #9 (Cont) #10	(5830-5	(880+)		
	Υ	 -		Residual 8	la a manada a	·1	Permeability. Md.O-O	•	Water co	turation, %	D
Drilling Time	Depth	Permeability	Porosity	Percent Pe		Probable	100 75 50 25 0			ation, % Por	
Min/FL	Peet	Millidarcys	Percent	Oil	Water	Production	Porosity %		on satur. O	25 50	75
	5829.5	0.0	4.8	25.0	70.0	Nil		 5830 			
1 .	5830.5 5831.5	0.0	7.2 1.0	0.0	33.0	Nil		, , , , , , , , , , , , , , , , , , ,		B	ШП
1	5832.5	0.0	4.6	0.0	18.5	"	1	Ī			
ŀ	5833.5	0.0	4.9	0.0	34.2	п	}}}}	`	═╍╬╁┼		\
1	5834.5	0.0	3.8	0.0	31.2	11	<u> </u>				╁╁╁╁╁
	5835.5	0.0	4.5	0.0	36.6	n		, <u>†</u>		1 6 1	†††††
1.	5836.5	0.0	5.4	0.0	47.0	n		, <u> </u>			
1	5837.5	0.0	6.3	0.0	43.8	"	G G	, [19	
1	5838.5 5839.5	0.0	6.9	0.0	30.5	"	1444411144114414) <u>}</u>	' 	114111	ЩЦ
	5840.5	0.0	8.5 3.8	0.0	81.7		<u> </u>	5840 H			
1	5841.5	0.0	6.1	0.0	25.1 15.0	, ,		´		/	╁╂╂╂┼
1	5842.5	0.0	2.5	0.0	30.1	,,,	<u> </u>	, 1			+++++
1	5843.5	0.0	2.0	0.0	35.1	n		, <u>þ</u>	╤╬╅┼┼	 	
1	5844.5	0.0	4.1	0.0	22.9	n		, <u>j</u> z			
1	5845.5	0.0	3.0	0.0	22.7	11		<u> </u>		Ŕ .	
	5846.5	0.0	2.7	0.0	25.9	Ħ		, [A	
	5847.5 5848.5	0.0	3.3	0.0	0.0	" ') <u> </u>	二幣		
- 13.V	2849.5	0.0	3.0	0.0	31.7	11	\\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\) H		 	╁╂╁╂╂
, .	5850.5	0.0	2.3	0.0	0.0	,	<u>┡</u> ┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼	5850			╂┼┼┼┼
	5851.5	0.0	4.5	0.0	21.5	n	<u> </u>			6111111	+++++
,	5852.5	0.0	6.3	0.0	11.4	n		›		<i>/</i> 111111	}}}}}
1 7	5853.5	0.0	6.0	0.0	12.5	n,		þ			
	5854.5	0.0	2.4	. 0.0	31,4	") þ			ЩЩ
	5855.5 5856.5	0.0	2.5		15.6	"			 	F4	
100	6857.5	0.0	7.2 14.0	18.8	27.9	11 m		, E			
	5858.5	0.0	2.8		11.8	'n		. 4		1	
	5859.5	0.0	1.3	0.0	99.8	11		, , , , , , , , , , , , , , , , , , ,		 	}}}
	\$860.5	0.0	0.9	0.0	13.4	"		5860			+++
1.	5861.5	0.0	1.0	0.0	76.7	11		,			###
1	5862.5	0.0	0.4	0.0	18.1	n					
	5863.5	0.0	1.2	0.0	0.0	"					
	5864.5 5865.5	0.0	2,3	0.0	32.7	"			===		_
	5866.5	0.0	0.7	0.0	13.7	10					+
	£867.5	0.0	1.1	0.0	0.0	"			╬	#++++	+
1	5868.5	0.0	5.9	0.0	0.0	н				╿┋ ┞╏╏	†
1	5869.5	0.0	4.0	0.0	17.2	"	- - - - - - - - - - - - - - - - - - 	5870			I
1	5870.5	0.0	3.4	0.0	20.1	n					1
1	5871.5 5872.5	0.0	2.7	0.0	36.8	"					+
	1	0.0	2.1	0.0	47.9	"		-			+
\ .	\$873.5	0.0	3.0	0.0	30.8	11		(F	-11		+

Company	С? Н. М	URPIY JI	R. FT.	AL. \	as i	Locat	ion				File	· · · · · · · · · · · · · · · · · · ·
Well	EAST PO	PLAR UN	IT.# 1			— Leger	nd:	Sand				Eng
Field					•	_		Shale Lime				Unit
County_	<u> </u>		State_	<u> </u>		Rema	rks	Core #10 (Co	nt)#1	1 (588	1-59001	<u>}#13(5915-5926·)</u>
Drilling Time Min/Ft	Depth Peet	Permeability Millidarcys		Residual S Percent Po		Probable Production	1	Porosity %	.25 O		-	aturation, % Pore oction, % Pore 1000000000000000000000000000000000000
	5875.5555 5875.655555 5875.655555 5877.655 5877.655 58877.655 58887.765 58887.765 5888.765 5889.7		3.6 2.9 3.8 3.8 3.1 3.8 3.1 3.8 3.1 3.8 3.1 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	19.4 33.3 50.5 46.9 49.7 42.0 0.0 0.0 51.8 21.4 0.0 0.0 24.2 24.2							
	5900.5 5901.5 5902.5 5903.5 5903.5 5905.5 5908.5 59		1.7 2.6 2.5 1.7 3.6 2.0 1.1 1.3 2.0 2.1 1.3 2.0 2.1 1.3	21.9 18.3 18.4 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	26.3 55.0 74.0 62.6 29.4- 56.5 25.0 48.5 63.0 84.7 50.0 61.3 36.9 68.2 46.7	Ril n n n n n n n n n				5910 5915 -		

	C 11 \	 TO DUDE - E							0
Company	. C. H. X	UKPHY J:	t. ET. Y	<u> </u>		Local	tion	File	
									1 March
WeÜ	EAST POP	LAR UNTO	ר ע י				Sand		
			- 0 1 1 2 2 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		:	Lege	nd: Sand		Eng.
		•	,	The second second	•	Deg C	Shale		
Field		·	<u></u>		· ·				Unit
探察 等	• •	• • • •	30000	7.30.10			Lime		Onit
					:-	_	Cama # 32 (Camb)	1004 361183	C/C00(/ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
County_			State		:	Rema	arks Core # 13 (Cont) #11 ((5926-361)#1	5(5936 - 601) 🔝
11,343,64	·		V. 3000	970. <u>97</u> .	<u> </u>		Permeability, Md.O-O Co	ore #16 (596	2-59951)
Drilling		L		Residual E			100 75 50 25 0	Water sa	uration, % Pore
Time	Depth	Permeability	47.014.00		ore Space	Probable	Danasika (Y	Oil satura	tion, % Pore
Min?Pe.	Pest	Millidareys	Percent	ÖH	Water	Production	40 30 20 10 0		25 50 75
1-4 14.19 (8	5919.5	0.0	4.0	0.0	38.6	Nil		1 _	The state of the s
						1	59	20	
THE P	5920.5	0.0	3.3		48.6	"			
	5921.5	0.0	وميات	0.0	26.6	u		<u> </u>	
	5922.5	0.0	22.3	0.0	38.9	tt		1	
	5923.5	0.0	2.8	0.0	31.9	l 19		┇═╧═┇┼┼╅	
	5924.5	0.0	2.3	0.0		"	 	┢═╧┲╃	
	P724.5		, C.D.	U.U.	39.8	I. "	\\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	· ┪╾╌ ┰ ┩ ┩	
77.57.27	12006 2	1		1. 14. 15. 15. 15. 15. 15. 15. 15. 15. 15. 15	-	1	<u> </u>	026	11111111111111111111111111111111111111
	5926.5	0.0	2.0	0.0	26.9	Nil	111111111111111111111111111111111111111	926	•
	5927.5	0.0	€ 2.4	0.0	29.5	l n		• [
	5928.5	0.0	2.0	0.0	39.3	n		· [[]]	
PAGE 5	5929.5	0.0	2.3	0.0	50.5	l n	╻┍╅┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼	<u> </u>	
	5930.5	0.0				n	1 } } } }	┩┍┸╌ ╃ ╏╏	
			1.7	0.0	82.7		111111111111111111111111111111111111111		
	5931.5	0.0	2.3	0.0	76.8	111	1(1111111111111111111111111111111111111		
	5932.5	0.0	1.1	0.0	61.5	H ·		╟╸╻┖	
	5933.5	0.0	2.2	0.0	97.0	n			
t in free con-	5934.5	0.0	2.8	0.0	30.2	н н	┨┢ ┩┼╏╏╏╏╏ ┇		╎╎ ╁╏╏╏╏╏
3.	5935.5	0.0	2.9		4	,,,	1	 - - 	1187111111
464				.0.0	28.3		 	36 - [[P]-[1]
72	5936.5	0.0	1.0	0.0	86.0	Nil	! <u> </u>	~ [
1.	5937.5	0.0	1.7.	0.0	44.0	n		<u> </u>	
	5938.5	0.0	1.1	0.0	68.2	j n			
	5939.5	0.0	2.0	0.0	64.0	n	J		
	5940.5	0.0			1	I 11	1 }}}}}+}	40 · {i}}	
			2.0	0.0	97.0	1	11+++++++++++++++	\ 	
1	5941.5	0.0	1.6	0.0	95.5	17	<u> </u>		
	5942.5	0.0	1.0	0.0	75.5	n		` <u> </u>	
	5943.5	0.0	1.1	0.0	79.6	n		┞┸╌┰┸╏ТТТ	
	5944.5	0.0	1.8	0.0	41.7	n	111111111111111111111111111111111111111		1116171111
	50,5 5	0.0	1 6		46.7	1 7		┃	++++\\\+++++
, .	5945.5 5946.5 5947.5		7.0	0.0	140.			┠┍╸╵╸╏╏ ┩	╁╃┼╃┇┇
1 4	5,40.5	0.0	2.6	0.0	97.0	n	1 	┎╼ ┼┼┼	┧ ┇╏╏╏╏╏
	P34(•5	0.0	2.6 1.2 2.7	0.0	93.4	"			<u>. </u>
1.0	5948.5	0.0	2.7	0.0	97.8	n		<u> </u>	
	5949.5	0.0	1.1	0.0	91.5	n		<u>, </u>	
1:	5950.5	0.0	1.0	0.0	98.5		JH-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	50 1-1-1-1-1	┤╏ ┼┼┼┼┼┼
	5951.5	0.0				-	1	<u> </u>	╏╸┇╸╏╸╏╸╏
1.30	E050 -		1.0	0.0	91.0	1		┎┸╗╽ ┦	┖╏╏╏╏╏╏
4	5952.5	0.0	3.7	0.0	21.9	n			<u> </u>
. 7	5953.5	0.0	1.0	0.0	91.9	n	l III III III ii ii	<u> </u>	
	5954.5	0.0	1.2	0.0	53.6	- n]]]]]]]]]]]]	<u> </u>	
1	5955.5	0.0	1.8	0.0	14.3	-17		 	
1.1	5956.5	0.0	1.0	0.0	89.9	n		<u> </u>	
1	5957.5					1	╻╒┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼	┠┍┸╌┩╏ ┼┼	┤ ┤ ┼┼┤ <u>╏</u> ╏╏╬┼┼┼┼
Ι.	F22[02	0.0	1.7	0.0	6.بلنا	l n	1+++++++++++++++	 	
1	5958.5	0.0	1.9	0.0	89.9	n		<u> </u>	
<u></u>	5959.5	0.0	0.8	0.0	95.0	n	111111111111111111111111111111111111111	60 <u>- 1</u>	
I	1	1				· -	59	\sim τ τ τ τ	
I	I]		i	1	I	I 	[}-}-}-	┪╋╏┩┪
	5962 5	0.0	1.7	0.0	1.7 0	Na 7	 	62 1 1	11116111111
74	5962.5 5963.5	0.0			47.5	Nil	<u> </u>	╏┍╌╵╼ ╗ ┩╏ ┪	
	F J - J	1	17	0.0	42.0	"		F-3111	
	<u> </u>			l	L	1	111111111111111111111111111111111111111		PILIP

Company	C. H. MU	RPHY JR.	ET Al	٠ ٠ ٠	<u>; </u>	Locati	ion .		·	<u>: </u>			·	ile	• •		i. 	
N. 18	EAST POP					•	•		·"		•	·· · .	• •	·		or a constant	· ·	
Well			# \ * \ .	:		— Legen	d:	Sand.	·:			rt.			Eng.		···	
Field								Shale.			Que	rtzeee	ق مع	<u> </u>	Unit			
	•		建筑 的模型	:::	•			Lime:.	<u></u> 6			· · · ·			Unit	: .		
County_	<u> </u>		State_			Remai	rks (ore	#16	(Cor	nt)#	18. (6009	-6031	<u>,1) "</u>	<u>.</u>	•:		
	1.	<u>" । ५५.५</u> जि	4 2 3 3 3	Residual 8	etaration	•	10	Perm	eabili	ity. M	d. o 25	- ္လွ်	· Wata	F satu	ration	, % P		
Drilling	Depth	Permeability	Porosity	Percent Po		Probable				y %.		<u></u>				Pore		
Min/FL	Peet	Millidareys	Percent	Oii	Water	Production	4,0	30	2	0	10	9) :2		50	75	
	5964.5 5965.5	0.0	2.0		50.6	Nil	Ш	4444	\prod	\prod	\prod	<u> </u>						Ш
	70203	0.0	2.3	:0.0	42.6	P	Н	╂	+++	++++	╂╂╂	₩		++++	1	┼┼┼┼	-	-
	1						Ш	 	 	1111	╁┼┼	\forall			╂┼╂┼	HH	H	1
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	l ·						Ш	4444	┼┼┼┧		4444	 5970	# + +		\prod		Ш	
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TH_ HYCALOG COMPANY CORE ANALYSIS REPORT Location

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6126.5 0.0 16:0 8.4 15.2 17.3 50.2 7 7 7 6128.5 0.0 18:7 13.5 15.8 7 8 7 15.8 7 15.			0.0%	9.7	23.4		1	\prod			Þ			
6127.5		16125.5 :	1 . 2.3	79.9			1	╿╟		11111	.			2 - 12 - 12 - 13 - 13
6128.5 0.0 8.7 13.5 15.8 n n d d d d d d d d d d d d d d d d d		6127.5	0.0	17.5	21.3		1	$\ \cdot\ $		<u> </u>	P		<u> </u>	21111111
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6131.5 Trace 1.6 1.7.2 1.6 1.7.2 1.6 1.3.5 6132.5 Trace 1.5.6 1.7.2 1.7.		6129.5		9.0	14.2		£	$ \dagger$	 					
6132.5 Trace 3.4 35.2 22.8 n M11 6 134.5 0.0 3.2 52.0 29.3 n d d d d d d d d d d d d d d d d d d		1 4		11.3	20.6	72.1	n	\prod			6130			
6133.5								$ \parallel$	111111		}	<u> </u>	S C	
6131.5 0.0 2.0 20.3 30.4 " 6117.5 0.1 2.9 38.1 30.5 0il				3.4	39.2		i	$\parallel \parallel$	 			TA		
6147.5 0.1 2.9 38.1 30.5 0il 6149.5 0.0 2.9 0.0 22.9 Nil 6151.5 0.2 4.7 31.4 19.5 n 6153.5 0.1 5.1 39.1 22.2 n		613/15					4	╽╫	╏╏╏╏	+++++	Ĭ			
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61\(\frac{1}{1}\), \(\frac{1}{1}\), \(\frac{1}\), \(\frac{1}{1}\), \(\frac{1}{1}\), \(\frac{1}{1}\), \(\frac{1}\), \(\frac{1}{1}\), \(\frac{1}\), \(H	} 	╂╂╂╂┼	1	4		
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6149.5 0.0 2.9 0.0 22.9 Nil 6151.5 0.2 4.7 31.4 19.5 " 6153.5 0.1 5.1 39.1 22.2 " 6153.5 0.1 5.1 39.1 22.2 "		ì	1 3			i		╟	╏╏╏╏╏╏╏	╫╫	-		╅╂╂╂	
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	*	COTOTOD .	0.2	34.7	31.4	19.5	"	1#	┞╏╏╏╏╏	╁┼┼┼┼	1		****	
	1	6153.5	أ ما	ेंद्रा	30 7	22 2	"	IH	╏╏╏╏╏╏╏╏	 	\$	工'''		
The state of the s	<u> </u>			× %	٠٠٠٠	[26.6	"	Π	 	 	1.	压		
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Murphy Corporation:

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The following are field calculations of the pressure surveys on EPU wells #1, #3, #4, 1 There values were obtained using the bomb calibration obtained prior to leaving Caeser, and therefore may vary a few (#5 max.) poune either way when final report is mailed. I have no explaination for the apparent increase of BHP. on wint #1, ove the value obtained lad Ffpril.

EPU No. Depth. Pressure Data

5799 3000 ps; Calculate

at 5700 2754 measured

3 5599 2836 measured

4 5724 2896 measured

5 6786 2872 0 1-41

Company.	C. H.	MIRPHY	JR. ET	IA		Locat	ation File	· · ·
Well	EAST P	OPLAR UN	IT#1			 Leger	Sand Eng.	
Field		••				Leger	Shale	
							Line	
County_						Rema	arks Core # 21 (Cont) Permeability, Md.O—O	
Drilling Time	Depth Feet	Permeability Millidarcys		Residual 8 Percent Po	re Space	Production	Porosity % Oil saturation, R Por	
Min/FL				Oil	Water		$\begin{array}{cccccccccccccccccccccccccccccccccccc$	75.
	6155.5	0.1	7.1	25.1	37.3	Nil		
	6157.5	0.0	3.8	J171°2	22.2	11		
	6159.5	0.4	3.8	35.1	35.1	011	6160	: P . 7
	6161.5	0.3	8.1	22.6	42.3	n		
	6163.5	1.0	9.9	214.3	53.1	n		1 2
	6165.5	0.3	և.2	32.7	21.8	n·		
	6167.5	Trace	2.7	46.3	37.9	n		
	6169.5	0.1	հ.հ	43.9	24.3	n	6170	
,	6171.5	0.1	6.5	18.4	19.0	'n		
·	6173.5	0.2	4.7	54.0	24.0	n		
	6175.5	0.9	և.6	28.կ	21.3	п		
	6177.5	4.0	4.6	32.7	20.1	"		
	6179.5	0.4	5.6	23.6	13.8	"	6180	
	6181.5	1.1	4.7	32.կ	20.8	n.		
	6183.5	0.3	4.1	11.0	22.0	n n		}
	6185-5	0.3	եւկ	10.5	36.7	n		
	6188.5	0.6	4.1	10.9	38.2	"	6190	
	6192.5	0.6	r °8	29.5	29.9	n		
	6195.5	0.6	8.5	13.3	13.3	11		
<u></u>	<u> </u>	<u> </u>	*	<u> </u>	L	<u> </u>		

Company.	<u> </u>	NOR PHY	IP FT	· · - AL		Locati	ion _						ŀ	ile		,	<u> </u>	
Well	EAST	POPLAR U	NIT # 1			— _{Legen}	a:	Sand	<u></u> []	::: <u>:</u>			⊏		Eng	·		
Field						64	i	Shale_							Unit	•		
1 1010		*::	•	:.				Lime					⊏			· 		
County	<u>- </u>	<u> </u>	State_			Remai	rks _	Co	re #	21	(Cont)	# 22	(620)	3-625	81)			
<u></u>	<u></u>		<u>, y, </u>	Residual 8	eturation		• • •	Perm	enbili	ty. M	4.00		Wate	r satu	ration	. et.	D	
Drilling Time	Depth	Permeability	Perceity	Percent Po	re Space	Probable	Too) 7	rosity		25			aturati				://////
, Min/FL	Feet	Millidareye		OII	Water		10	30	2() ":	ip (_		50	75	
	6199.5	0.8	6.1	0.0	12,6	Gas	$\parallel \parallel \parallel$	++++	++++	Ш		6200		J b	Ш	Ш	Ш	\coprod
	·		5 7	:	•		}}	┼┼┼┼	++++	++++	╂╂┼┼╂	i		╌╂╂╂	$\frac{1}{1}$	╂╂┦	┝╂┼╂	
<u> </u>	6202.5	17.3.	5.4	0.0	15.6	Gas		1111	Π	1111	16:11	(00.0		1	1111	++++	┟╂╂	
	· · ·						Ш	Ш	Ш			- 620 3	芦					
	620li-5	1.9	5.0	0.0	16.6	Gas.		++++	++++	+++		1	井	118	1111	444		Щ
1	6206.5	0.4	5.8	0.0	14.3	Ges		╫╫	╂╂╂╂	+++	1111	,			++++	╁╂╁┦	┟┼┼┧	+ + + +
	6207.5	0.0	8.9	0.0	30.4	Nil		 	1111	1111		þ			4611	++++	 	/
] .	6208.5	0.4	5.6	20.5		Gas-01	Π	Ш	Ш	Ш			田		R		Ш	
<u> </u>	6210.5		6.0	1,, ,	1,80		<u> </u>	++++	1111	+++	++++	6210	一		4411	+++	+ + + +	HH
	0210.5	0,3	6.9	13.5	10.9	Gas-Ot	} }}	++++	+++	╂╂╂	++++	ĺ			+++	╁╁╂┦	┝╾╂╼┨	
•	6212.5	0.9	3.5	0.0	63.0	Cas		1111	111	.††††	††† <u>†</u>				1 111	 		- - -
				.			Ш	Т	Ш									
	6211.5	0.3	9.0	4.5	11.3	Gas-Oi	1		1111	+++	<u> </u>			X	++++	444	\prod	Ш
·	6216.5	0.0	7.3	18.և	52.2	633		++++	+++	╂╂╏	1:11	{				+		HH
! :		13.3			/	011			1111	 	 	Ì	-		 	11		┟┼┼┼
	6218.5	0.6	7.7	16.8	16.8	Oil	Ш		Ш	Ш			三				Ш	皿
	6220.5	7.20**	5.6	27 2	21 2	1		1111	{}}}		╃┼┼┼	6220	├	2000		+++	\square	HH
.]		102) - D O	31,2	31.2	Oil	}}	++++	╁╂╂		╂┼┼┼	1	旦			+++	┟┼┼┤	┟╁┼
 -	6222.5	0.5	:6.4	6.6	13.2	Gas-Oi	$\int \int \int d^3x dx$	1111	††††	††† †	11:11				++++	+++		
	ن د ده				1	1	Ш		Ш]	H		\prod		Ш	Ш
	6224.5	1.0	7.7	5.7:	34.2	Gas-Oi	┇┼┼	4444	++++		<u> </u>	1	中		10	+++	+++	HHH
1		1 20		:	l		 	++++	 	+++	╂┼┼┼┼	1		┠╂╂╂	╂╂╂	╫	╫╫	HH
1					1			1111	††††	1111	 	1		 	1111	 		
:	i				١.		Ш	Ш	Ш	Ш			四			\coprod	Ш	Ш
}.					1			\prod	4444	4444	$\frac{1}{1}$	6230			++++		Ш	\coprod
1	•	3 %		.]			╏┝╫╢	╂┼╂┼	┼┼┼┼	++++	++++	}	臣	$\left\{ +\right\} +\left\{ \right\}$	+++	╁╂┼	HH	HH
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1						İ	$\ \ \ $	 	 	1111	44444	1		14444	4111	444	\coprod	
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1							╏┟┼┼	++++	╀┼┼	+++	++++	i		┠ ┼┼┼┤	╅╅╁	+++	HH	
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				1				 	┼┼┼╂	$\dagger\dagger\dagger\dagger$	 	1			1111	##		HH
1 .] ']		1			١Щ	Ш	Ш	Ш		}						7

Company	C. H.	MURPHY	JR ET	C. AL		Locat	ion	File	ممشم
Well	EAST I	POPLAR U	nir # 1	L		— ,	Sand		Eng
	•				•	: :	Shale		÷ .
ield						_	Lime		Unit
Jounty_	<u> </u>		State			Rema	rks Core # 22 (Cont) #	7 23 (6258-6	314')
Drilling			<u></u>	Residual 8	aturation	,	Permeability, Md.O O 100 75 50 25 0		uration, % Pore (
Time	Depth :	Permeablity Millidarcys	Porosity Percent	1 .				Oil satura	tion, % Pore 🖹
Min/FL				OII	Water	Production	40 30 20 10 0	2	25 50 75
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Field				• •		- , / .	Lime		Unit
County_			State	-	· · ·	Remar	ksCore # 23		(6314-6372!)
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Company	С. Н.	KURPHY	JR. FT.	ΛL	· .	Locat	ion					:	<u>.</u> F	ile	<u>'</u>		<u>:</u>	د به دون ور درون
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County	-	· · · · · · · · · · · · · · · · · · ·	State			Remai	arks Core # 25 (Cont)	
Drilling Time Min/Ft	Depth Peet	Permeability Millidarcys		Residual 8 Percent Po	re Space	Probable Production	Permeability, Md.O—O 100 175 .50 .25 0 Porosity %	
	6380.5	0.0	۶ . 0	0.0	18.0		6360	
	6385.5	0.0	4.5	0.0	20.4	Nil		
	6390.5	0.0	3.3	0.0	27 . 0	Nil	6390	
	6395.5	0.0	1.9	0.0	70.2	Hi1		
	6400.5	0.0	1.6	0.0	35.9	Nil	6lpo	
	6405.5	0.0	2.2	0.0	0.0	Ni1		
	6410.5	0.0	3.2	0.0	27.8	Nil	6l,10	
	6415.5	0.0	4.5	0.0	15.8	Nil		
	6µ20°2	0.0	0.9	0.0	0.0	Nil	6420	

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Field			da da			 ":	Lime	Unit
Country						D	rks Core # 25 (Cont)#26(8430_64881
County		3	Suite_			Remi	Table 1 27 (Sono) Hebit	200-0400 /
Drilling	· 1.75			Residual 8			Permeability, Md.0—0 100 75 50 25 0	Water saturation % Pore O-
Time	Depth !	Permeability Millidareys	Percent	1	·	Probable Procuettor	I • PATASITY (74	Oil saturation, % Pore 1999
Min/FL				011	Water		40 30 20 10 0	0 25 50 75
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Field	<u> </u>					- .	Lime U	Jnit
County			State		<u>-</u>	Rem	arks Core #26 (Cont) # 27 (6488-6528')	
Drilling	T . :	L		Rosidual E	leturation	T	Permeability, Md.O C Water saturat	tion, % Pore O
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		•				Lege	Shale			
Field		•					Lime		Unit	
County	· · · · · · · · · · · · · · · · · · ·		State			Reme	rks Core # 27 (Cont) # 28 (6530	. 65991	1	
County						Keine	Parmachility Md O		•	
Drilling	Depth	Permeability	Porosity	Residual S Percent Po		Dark. Ma	100		uration, %	
Time Min/Ft	Pest	Millidareys	Percent	Oli	Water	Production	Porosity % 0 40 30 20 10 0		tion, % Po 25 50	
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Company	C. H.	MURPHY	JR ET	AL		Locat	ion	rile		
Well	EAST 1	POPLAR U	NIT#1	L			Sand	, . : i .	Eng.	
E:AJ		••			•	Lege	nd: Shale			
•	·						Lime		Unit	
County_		•	State			Rema	rks Core # 28 (Cont)	<u> </u>		
Drilling Time	Depth Feet	Permeability Millidarcys		Residual S Percent P	Saturation	•	100 75 50 25 °		iration, % Po ion, % Pore	
Min/FL		7	:	OII	Water			1 2		75 7
	6560.5	0.0	0.0	0.0	0.0	MI.	6560			
	6565.5	0.0	0.0	0.0	0.0	MI				
		·	٠							
	6570.5	0.0	0.0	0.0	0.0	Nil	6570			
	6575.5	0.0	0.0	0.0	0.0	Mil				++++
	6580.5	0.0	0.0	0.0	0.0	HI	658	0		
	·									
	6585.5	0.0	0.0	0.0	0.0	/Nil				++++
·	6588.5	0.0	0.0	0.0	0.0	Nil	658	8 - 0		
							6590			
	6593.5	0.0	0.0	0.0	0.0	Nil				
							<u> </u>			 ╅╫╬
	6598.5	0.0	0.0	0.0	0.0	Nil				
							650			
	6603.5	0.0	0.0	0.0	0.0	Mil				++++

Company.	C. H. N	URPHY J	R. ET A	T.		Location	on				File	<u>::</u>	#			
Well	BAST PO	PLAR UN	IT # 1				Sand	- TEXT	•		···		Eng			
		•	• •			Legend	1:					· □	<u>-</u> -			_
Field		· . :-	<u> </u>		 	- . ·	Lime	EE _				j	Unit_			
County		· ·	State			: Remarl	ks Core #	28 (Cont	;) # 80	(66	46-670)41)				
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Drilling Time	Depth	Permeability	Porosity	Residual 8 Percent Po	_		100 75	50 25			Water.		•			
Min/Ft	Pest	Milldarcys	Percent	OII	Water	Probable Production	Porosi 0 30	ity % 20 10	ġ		Oil satt		n, % 1 5(75	
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Well	EAST PO	PLAR UN	IT # 1		·	— Legen	i:	80.00 Eng
Field	· ·	·	•				Shale	Unit
		•			·		Lime	
County	• :		State_			Remar	ks Core # 80 (Cont) Permeability, Md.0-0	
Drilling Time	Depth	Permeability	Parosity	Residual B. Percent Po	re Space		100 75 60 25 0	Water saturation, % Porc O-
Min/FL	Post	Millidareye	Percent	OII	Wa≒r	Production	Porosity %	Oil saturation; % Pore
	6656.5	0•0	0.0	0.0	0.0	ml	668	
	6666.5	0.0	0.0	0.0	0.0	Nil	66	
	6676.5	0.0	0.0	0.0	0.0	MI	66	30
	6686.5	0.0	0.0	0.0	0.0	N11	66	90

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Well	EAST PO	DPLAR UN	IT # 1		•		Sand	<u> (::::</u>	Anhv	drite.	: <i>اعل</i> امه	ं । दानी	Enc		•
						Leger	d: Shale								
Field	10	<u>, , , , , , , , , , , , , , , , , , , </u>				· ·	Lime	•					Unit_		
			State	•		Rema	rks <u>Core</u>	 # 30 (d	Cont)	# 31			• •		•
		• • • • •	-				Perme	ability, Mo		- 	٠.		٠.		:
Drilling Time		Permeability	Porosity	Residual 8 Percent Po	6	Probable	100 75	50	25 O		_				ore 0
Min/FL	Pest	Milldareys	Percent	011	Water	Production	40 30	rosity % 20 1	ρ q			25			75
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Company	C. H.	JURPHY. J	R. ET	<u>, , , , , , , , , , , , , , , , , , , </u>		Location			File -
Well	EAST PO	OPLAR UN	IT # 1			Legend:	Sand	Anhydrite.	Eng.
(Field						Legena:	Shale		
11010	1 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3					 .	Lime		Unit
County			State			Remarks	Core # 31 (0		6762-6821)
Drilling				Residual 8	Saturation	10	Permeability, M	d. oo 25 0	Water saturation, % Pore C
Time Min/Ft	Depth Feet	Permeability Millidarcys	Porosity Percent	Percent P	Water	Production 4.0	Forosity %.	•••••	Oil saturation, % Pore
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Company_	C. H.	WRPHY J	R. ET	AL.		Locat	ion _						· t '	ile			a	
Well	EAST P	OPLAR UN	IIT # 1					Sand	. (333).	Ant					Enc	Z	٠.	
5		٠٠.			•	Legei	nd:	Shale							•			
Field		•	-					Lime	_ E					Ţ,	Uni	t		
County	· · · · ·		State_									3 3 (68	321 <u>-</u> 6	8791)	· ·	·	·
Drilling			D 14	Residual S Percent Po	aturation	, i.u.	10	Permes	bility, 1 50	.25 25			Wate	r satı	ratio	n, %]	Pore C	
Time Min/FL	Depth Peet	Permeability Millidarcys	Percent	Oil	Water	Production	40	Pord 3,0	20				Oil se	turat	ion, 9 25	% Por	75	
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TH HYCALOG COMPANY

CORE ANALYSIS REPORT

Company_	C. H.	MURPHY 1	R ET	AT.		Locat	ion		File
Well	BAST P	OPLAR UN	IIT # 1		• .	Leger	Sand		Eng.
Field			· ·						Unit
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County		.	State_			Rema	rks <u>Cora # 38 (C</u> Permeability, M		
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	Ca Ha Ha			<u> </u>		Local	on File	
Well	EAST PO	FLAR UNI	<u>T # 1</u>	_ 		— Lege	d: Sand Dolomite Eng	
Field	· · · · · · · · · · · · · · · · · · ·	·······					Shale Anhydrite Vinit	
County_	**************************************	· · ·	State			· Rema	ks Core # 63 (Cont)# 64 (8406-8419)	
Drilling		Permeability	Pornalty	Residual S	aturation ore Space	Probable	Permeability, Md.O-O # 65 (8419-84771) 100 75 50 25 0 Water saturation, % Po	
Time Min/Ft	Peet	Millidarcya	Percent	Oil	Water	Production	Porosity % Oil saturation, % Pore	75 ·
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	8409.5	0.0	3.2		22.5			
	0403.3	0.0	3.2	0.0	22.5	Hil	8410	
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	8415.5	0.0	2.2	0.0	33.7	 Mil		##
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	8429,5	0.0	0.0	0.0	0.0	Nil	6430	
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County_		• • • •	State			Rema	rks Core #	⁴ 65 (C	ont)						
				Residual 8	Atgration	~ · · · ·	Permea	bility, M	d. o o		Water sa	turation.	% P	nra A	
Drilling Time	Depth	Permeability		Percent Po	0	Probable	100 175	50 sity %	<u> </u>	•	Oil satur	• *			
Min/Ft	I .	Millidarcys		OII	Water	Production	40 30	20	10 0		0	25		75	
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Field		<u> </u>				—	<u>I</u>	.ime		J				Ųnit			
County_	1.1	·············	State_			Remai	ks	Core	# 66	(Cont)	# 70 (8622-8	680) <u>.</u>			
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Drilling Time		Permeability Millidateya	Parasity Percent		re Space	Probable	100	75 Por	50 posity %	_25_		Oil sa					
Min/FL	Peet	Aulidareys	rereal	011	Water	Production	40 1111	30	osity % 20	10	Q		2				
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Company.	С. Н.	MURPHY .	JR. ET	AL,		Locat	ion		File		
Well	EAST P	OPLAR U	NIT # 1				Sand	Dolomit	<u> </u>		
	•					Leger	shale				
Field							Lime	_		Unit	
County			State			Rema	rks <u>Core # 70 (C</u>	ont) # 72	(8686-8737	<u>.</u>	
	γ			Ja (1 1 5			Permeability. M	d. oo		uration, % P	
Drilling Time	Depth	Permeability		Percent Po	re Space	Probable	100 75 50 Pormaity %	25 0		tion, % Pore	
Min/Ft	Peet	Milidareys	Percent	Oil	Water	Production	Porosity %40 30 20	10 0 111111	0	25 · 50	75
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Well	EAST PO	OPLAR UN	IT # 1			Legen	Sand	Dolomite		Eng
Field						Legen	. Shale			Unit
							Lime			
County			State_			Remar	rks Core # 72 (·
Drilling			9	Residual S	laturation		Permeability, M 100 75 50	25 0	Water satu	ration, % Pore O-
Time Min/FL	Depth Feet	Permeability Millidarcys	Porosity Percent	Oil	Water	Production	Porosity %.	10 Q	Oil saturati	ion, % Pore \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
	8695.5	0.0	5.7	0.0	26.4					
	8700.5	0.0	4.6	0.0	25.5	NTI		8700		8
	8705.5									
	6705.5	0.0	6.6	0.0	19.1	N11				
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	8715.5	0.0	6.6	0.0	16.8	NH1				
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Company.	C. H.	MRPHY J	R ET	VL		Loca	tion	·						_		;	ile	<u>.</u>			-:=		<u>. </u>		
Well	EAST PO	OPLAR UN	NT # 1					c	and	<u></u>			Da	1 ~	mite	2 _		20		r	_				
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County	5 9 5		oute_			rems	. r.K.B	ند.	Per	negh	ilits	. 14 '. 14	4.0-		Core	# 84 #	ر). تاريخ	±Į: 91(=₽ 02	-9.	بر ۱۵۱) 91)			—
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48 pages

1956-1960

WORKOVER NO. 1



WORKOVER HISTORY NO. 1

Worldware Translation and a
Date May 2, 1956
Lease and Well No. East Poplar Unit Well No. 1
Field East Poplar Unit County Roosevelt State Montana
Well Location SW NE Section 2, T29N, R51E.
Status prior to present job:
Date Completed: March 10, 1952 Date Last Workover None TD 9163' PBTD 5687' Producing Zone: "B1", "B2", & "C" gone of Madison Formation Perforations: "B1 & 2" 5648-80' w/4 jet S.P.F., "C" 5799-5814 w/6 BPF
Cumulative Production "Al & 2" 68,010 net bbls oil; "C" 70,709 net bbls oil. Latest test: "Bl & 2" 57 BOPD w/no water
Justification for Workover:
1. Repair leak close to the top of the 7" casing. 2. Run dual tubing strings and instell a pumping unit so that the R1 & 2 zone can be murred co-mingled while the C zone is flowing in order to increase

Summary of Workover:

3-19-56: PBTD 5827'. Hoved in and rigged pulling unit for emergency workover.

the fluid production from the Bl & 2 zones.

- 3-20-56: PBTD 5327. Fulled stringer out. Model "D" production packer flopper valve would not hold. Circulated with salt water. Water would not hold C zone.
- 3-21-56: PBTD 5827'. Killed well with 10# salt water. Found leak in 7" casing 6 to 8' below well head.
- 3-22-56: PBTD 5827. Circulated through leak in 7" casing out 13 3/8" casing. Hooked exhaust from rig motor into 7" and circulated out 13 3/8" casing. Cut window in 13 3/8" surface pipe and welded patch over leak. Pressured up to 600# on 7" casing, patch held o.k. Welded up window in 13 3/8" surface pipe and tested with 200# psi, held o.k.
- 3-23-56: PBTD 5827. Layed down 2 7/8" tubing. Started running 2 3/8" tubing in order to be able to run 2 strings in 7" casing so that the B1 & 2 zones can be pumped and the C zone can be flowed.
- 3-24-56: PBTD 5827'. Finished picking up 2 3/8" tubing, washed out 60' salt on top of packer, displaced water with oil. Shut in overnight.
- 3-25-56: PBTD 5827'. Flowed C zone o.k. Tested for communication, seal rings and packer. Held o.k. Pulled Otis side door choke, ran Otis separation tool. Blanked off C zone, started swabbing Bl & 2 zones. Swabbed 20% salt water. Fluid level 1400' from top. Het set over night. Would not flow.

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Workever History No. 1 Continued

- 3-26-56: PBTD 5827. Swabbed Bl & 2 zone at rate of 27 BFFH, 30% water.

 Ran 2 jts (40) 1" pipe between 13 3/8" surface casing and 7" casing to coment any future leak. A 1" plug valve is located 3' below head on west side of well. Released pulling unit 12:01 P.M., 3-26-56.
- 3-27-56: PETD 5827'. Waiting on material to run dual strings of tubing with pulling unit.
- 3-27-56: PBTD 5827. Pulled Otis seperation tool. Ran Otis side door choke. Flowing C zone.

Temporarily dropped from Report.

- 4-28-56: PBTD 5827'. Rigged up pulling unit.
- 4-29-56: PBTD 5827. Pulled Otis side door choke, ran Otis separation tool. Circulated out with 9.3# salt water. Well would still not flow. Pulled separation tool and ran side door choke. Checked for communication with pump pressure. No communication indicated. Re-ran separation tool. Let "B" zones flow overnight. Shut in pressure on B zones loaded with water is 200#.
- 4-30-56: PBTD 5827'. Opened B zones to test tank, still flowing small stream. Circulated out with water. Ran second string of tubing in well with turned down, beveled N-80 collars. Hooked up dual tubing head and closed well in.
- 5-1-56: PBTD 5827'. Preparing to set pumping unit to pump "B" zones.
- 5-2-56: PBTD 58271. Pulled Otis seperation tool. Ran Otis side door choke. Flowing "C" zone through one string of tubing.

 Dropped from report.

Results of Workover:

- 1. The leak in the 7" casing was repaired and 40' of 1" pipe was run in the annulus of the 7" and 13 3/8" casing in order that any future leaks can be cemented.
- 2. Fluid production of the Bl & 2 zones was increased from 57 BFFD with no water to 240 BFFD with 1% water.

Final Summary of Workover:

- 1. Perforations: Bl & 2 5648-5680 (unchanged) C zone 5799-5814 (unchanged)
- 2. PBTD: 5827! (unchanged)
- 3. Initial Potential: W. O. 240 BFPD with 1% water. (B1 & 2 zones)
- 4. Down hole equipment:

RECEIVED

Tubing Record for "C" zone:

Top Joint	30.66
Pup joint, 10' - 4' - 6'	20.11
186 jts 2 3/8" EUE tbg.	5685.15
Total tubing	5735.92
Below RKB	11,20
2" collar and 2" x 2 1/2" swedge	،76
Otis Flow nipple	2.12
Bottom of tubing	5750.00
Baker Seal nipple and loc, sub	3.08
Tail Pipe	7.92
Total bottom of tubing	5761.00

Tubing Record for "Bl & 2" zones:

Below RKB	11.20
Top joint .	31:13.
182 jts 2 3/8" w/turned down, beveled	
N-80 collars	5591.43
Perf. top 4º of jt.	28.20
Total	5561.96
Seating Nipple 1 25/32" 114 jts down	
at 31,50'.	

1 - 1 - 25/32" seating nipple spaced lll jts down.

Rod record:

1		3/4"	scraper sub (Huber)	
38	~	3/4"	scraper rods (Ruber)	9501
20	~	3/4"	plain rods (Type X)	5001
			plain rods (Type X)	20001

Pump - 2" x 1 1/2" x 16'6" with 5' cast iron plunger National insert pump.

5. Well Head Equipment:

Head = 13 3/8" O.D. x 12" Ser 900 Type C-18 OCT casing w/2-2" outlets. Hanger = 13 3/8" O.D. x 7" O.D. C-18 casing. Valve = 2" 6000# test WKM FE Gate

Hanger - 6^n Ser 900 x 2 $3/8^n$ x 2 $3/8^n$ Cameron dual type tubing head.

- 1. 2 3/8" 600 Ser. 1000# test special master Gate valve for dual completion (C-zone).
- 1. 2 3/8" OCT Adjustable choke (C zone).

6. Surface Equipment:

- 1 T17C1-D16OZ American pumping unit complete with frame extension, and ground lubrication system. Ser No. D 16O 72O.
- 1 30 H.P. General Electric 3 phase 60 cycle 220/440 volt splashproof electric motor with rodent screen protection.
- 1 General electric Type CR 7008E Size No. 3 motor control.

REGEINED

Workover History No. 2

JAN 7 - 1960

December 2 phases conservation commission OF THE STATE OF MUNTANA Lease and Well East Poplar Unit Well No. 1 Field East Foolar County Roosevelt Well Location SW NE Sec. 2, T28N, R51E State Montana Status Prior to Present Jobs Date Completed March 10, 1952 Date Last Workover May 2, 1956 TD 9263 B & C zone of Madison Pormation FBID 5827 Producing mone 5648-5680: C 5799-581h. Cumulative Production Perforations zone 209,105 BO, C 127,570 BO. Latest Test Panning B womes exemingled, 52 BOPD, 21 BMPD 28% Water, Flowing C zone 23 BOPD, blo ered, 95% water. Justification for Worker: To repair leak from C zone to B zone when C zone shut in, check deal strings of tuding for damage, increase production and lover water cut. Summary of Workeyer: See Attached summary of workover Regap of Workover: Final Parforations A sone 5524-5530, C zone 5799-5827 Final PBTD 5827 Initial Totantial after Workover C zone, flowing on P-36 choke, 217 HFFD 70% water. (65 BOPD, 152 BMPD) A cone, Pumping 293 BFPD, 71% water, (85 BOFD, 208 EMPD) A. and C zones of Madison formation. Geologic Name of Producing zone C.zone 11.00 Tubing Fecord Below RKB n.w 1.03 (Seating Mip.O ٠ ويلي تود Top Joint 16.CL 3.13. Subs 2-3/8" tubing (187(5672.19 (180) 5529.78 .80 Choka mipple **.68** Latch on Sub 2.74 Seal Assemblies Stinger 31.00 **30.9**0 5765.24 Bottom of Tubing

18- 3/4" plain rods 39- 3/4" scravers 9750 Combined production increased from 75 POPD to 151 BOPD. Gag. recalred. W.O. Suse Morkover Suscessful

132- 5/8" plain rods 33000 80 & 40 subs

1200

Rod Reward

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SUMMARY OF WORKOVER

JAN 7 - 1960

- 7-29-59 PETD 5327. Polling tubing. Mixed mad and killed well. OF THE STATE OF MORTANA
- 7-30-59 FBTD 5027°. Palled B zone tubing, installed BOP. Palled C zone tabing.
 Both strings of tubing in good condition execut for 6 arooked joints on tottom. Ram Baker junk basket on swab line. Started in hole with Halieburton RTTS Packer.
- 7-31-59 PBTD 5827. Conditioned mad and broke circulation. Ran Halliburton packer, set between B & C zone. Packer would not hold. Set backer above B zone to test easing above. Would not hold. Dropped ball and pressure tested tabing with 1700%. Held OK. Pulled tabing to check par.
- 6-1-59 PETD 5827°. Ram tubing with Baker fell here packer, set between B and C zones. Press. up on eag. to 750%. Held OK. Indicating no commanderation outside pipe and that eag. was good. Pulled the. Ram Baker junk backet on wireline. Set Model D packer on wireline, set at 57%5. Ram h. 000° of the with Baker seal assy. and 65° tail pipe. Displaced mud water.
- 8-2-59 FEID 50270. Tested for communication with little on easing. Held CK.
 Plowed C zone to pit until clean. Circ. hole with oil, tested for communication with little on eag. Held Ck. Formation broke at little.
 Passed 5 gal MOROflow mixed w/ 5 bbls. oil. Squeezed C zone 5797-5827 with 50 sax ant. mixed with diesel oil, squeezed bl sax ant. into formation at 1800. Pewersed 6 sax ant. to mit. Potter of tail pipe at 5809.
- 5-3-59 PETD 5827. Flowed C zone for 6 hrs. (80% water). Displaced water with oil. DOC Squeeze # 2 C zone 5799 to 5827 with 50 sax reg. cmt. mixed with diesel oil. Broke formation with 1100%. Fusced 5 gals HYFIO with 5 bbls oil shead slurry. Squeezed 22 sax cmt. out in formation, maximum pressure 2200%. Reversed out 28 sax cmt. Cleaned perf w/ 1.5 bbls of oil @ 1960%. 2 min. bleed down 1500%. Let cmt. set overnight 16% hrs.
- 8-4-59 FEID 5827 . Opened well to test tank. Flowed 36 BOPD, 17k BWFD, 33% water.
- 8-5-59 PSTD 5827 . Flow tested 51 BOPD, 158 BWFD, 90% water.
- 8-6-59 PETD 58270. Tripped the to remove Baker seal assy. and wick up full hore packer and DR plug. Tested DR plug w/ 7507. Held OK. Set packer acove 3 zones & suab to wit h hrs. 65% water.
- 8=9-59 PETD 58270. Acidized B corrections 5648 to 5680 with 1500 Gals. Haliburton HV soid. Scot acid down thg. Injected 1st 12 bbls. acid @ rate of 2 BFM @ 2000 #psi. Last 24 tbls. @ rate of 4.5 BFM @ 2500 #psi. Bleed down pressure zero. Let acid set on formation 2 hrs. Sweebed 2 hrs. to bit, rec. spent acid and water and oil. Swebbed 657 BFPD, 85% water. (9980FD, 558 BMPD). Chlorides b zone 94,000 PFM.

Laid down C zone tog. string. Ran B zone rods, tog and pump.

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- 8-10-59 to
 8-21-59 58270 PSTD. Fump tested. Last test 2 hrs. Pumped 325 BFPD, 90 OFFRESINE OF MOXIANA
 (312 EWPD, 13 BOFD)
- 6-25-59 FATO 58277. Pulled the Ran Baker full bore packer in hole. Tested the and DR plug in packer at 5750° with 2200 #, hold OK. Scotted approx. 3 bols of gel on top of DR plug. Pulled up. Broke formation with 11:00 at 5 BFM. Displaced esg. and the with oil. DCC Squeeze perfs. 5612-5680 with 75 sax reg. coment with 5 bols. dissel oil shead, 3 behind. Displaced 62 bols. (3) sax) in formation at 1200 lbs. Pressure started increasing, changed gears on pusp truck. Than squeezed, pressure went to 2800 lbs. Cay. and the communicated, reversed out 12 bols coment and dissel flag. Over rev. 70 bols., pulled packer. Found split joint at 12:7°. Joint split from rod wear. 8 bbls. cement in esg. should have 225° essent fillup.
- 8-26-59 FRID 5827°. Ficked up C-zone 2-3/8° tbg. to circulate and drill out cement from DOC squeeze. Picked up 177 joints, 5klll, and reversed circ. Found scattered stringers of cmt. approximately 2000° to 56lk°. Found firm cement from 56lk° to 56l6°. Washed through bridge OK. Approx. 5 bbls. of cement reversed cut of hole. Falled 6 stands out of hole and shut down overnight.
- 8-27-59 PMTD 58279. Went in hole with 627 bit. Started reversing ent. at 5620. Found firm coment at 5638. Could not wash through. Drilled with power swivel from 5638 to 5740. Firm coment as follows: 5638 to 5280, 5632 to 5661, and 5664 to 5675. From 5689 to 5740 cmt. accessed to slide down hole. Tagged top of DR plug at 5746. Reversed circ. from 2:30 PM to 5:30 PM and started out of hole.
- 8-28-39 PSID 5827°, Rem the with Baker full bore tacker. Set perior and test IR plug with 1900 les. Held OK. Reset packer at 5635 and smabbed 3 5648 to 5680. Swabbed dry. Let set 1 hr, made run with samb, rec. 3 BF, 190% oil. Swabbed 3 more brs. at rate of 18 30PD, no wire
- B-29-59 to
 d-31-59 FFTD 5827°. Swab tested. Lest test, 12 BFFD, 60% water. (5 807D, 7 BNFD). Pulled the Ran Lane wells Carma Ray Neutron Chlorimilog from 57hl.5 to 1500. Two inch Campa Ray Neutron from 1500 to 3000. Perio
- 9-1-59 FATO 58273. Ran thg, with Baker full bore packer. Set packer at 5722. Test DR plng with 1000 lbs. Held OK. Set packer at 5683 and check for communication between B perf. No communication. Swabbed B zone 5687-5691. Swabbed at rate of 108 BFFD, 95% water. (5 BOPD, 103 EMPD). Acidized B zone 5687-5691 with 500 gals. HOECO reg. acid. Acid feeding very slowly at 1500 lbs. Formation broke with 3 bbls. acid in. Inj. remainder of acid at rate of 4 bbls. per min. at 1000 lbs. Ho indication that zones cummunicated. Swabbed spent acid, oil and water.
- 9-2-59 FIID 5827%. Swabbed at rate of 593 BFFD, 97% water. (18 BOFD, 57% BVFD).

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- PBTD 5650. Test 12 plug with 3000 lbs. Held OK. Squeeze MAN AND SAS CONSERVATION COMMISSION B. Zone, 5616 to 5680 and B. zone 5687 to 5691 with 50 sax Conservation commission with the bolls. Water to 2000 lbs. Squeezed 50 sax coment cut in formation. Max. wress. 2600%. Would not hold. Cleared tool and let set thers. Squeeze No. 2, 50 sax reg. coment with HCWCO retarder added. Broke formation with the bolls. Water at 2600%. Squeezed 30 sax coment out in formation. Max. pressure 3800%. Held OK. Left 2.5 sax coment in eag. Reversed out 17.5 sax tement.
- 9-1-59 FETD 5530°. Tested squeeze with 3000°. Held OK. Made trip with tog. to remove pasker.

9-5-59 to 9-3-59 FNID 5630°. Weiting on valling unit.

- 9-10-59 PETD 5827. Pulled rods and tbg. Ran tbg with bit and rigged up power swivel. Drilled cement from 5630 to 5736, then dropped through 6° to top of IR plug at 5762. Circ. 3 hrs. Test squeeze with 1100%, Held OK. (Bottom of Bit perf. 5691°, hard coment to 5736.)
- Pellogo PRID 5827: Palled the, and perforated B. zone 5714 to 5724 with Wireline and Maratless ose, gum, h SPF. Ran the with Eaker full bore planest at 5712, then swatched the dry. Hade dry run every 10 minutes with each track arrived. Tested casing, BOP and plan with 1000%, Hold OM. Acidized B. perforations 5714-5724 with 500 gls. HOWO 15% reg. with Acid started feeding at 2200 m. Inj. 3 bile. at rate of \$ BFM & 2200%. Formation then broke to 2000%. Inj. remainder of acid at rate of 3 BFM at 2500%. Bleed down pressure to 1800%. Opened to nit, swabbed spant acid with trace of oil. Swabbed dry before said was responsed.
- Solution 1927. Swapped B some, 95% water. Tested casing and solution in the gave away. Moved that above B terms, and tested with 1900%, held OK. Set that between B terms, and cressured up to 1900% on the Held OK. Facet wire, between B terms, and attempted to cress, up on esg. Would not hold. Reset backer at various intervals between B cerms. Communicated each time. Reset cacker above B consequence of accing. Held OK. Indicated B cerms, still squeezed off and that communication is outside the pipe between B.
- 9-13-59 PETD 50271. Sat backer at 5686 and swabbed B. perforations. Swabbed tbg. dry. Swabbed 2 hrs. and recovered approx. 5 gals. fluid. per hr. Acidized B. zone 5687 to 5691 and B. zone 5714 to 5724 with 1500 gals. HOWCO RV acid. Injected 2 bbls. at rate of \$ BFM at 2000#. Next 3 bbls. at rate of 1 BFM at 2000#. Next 8 bbls. at rate of 2 BFM at 2000#. Remainder of acid at rate of 4 BFM at 2100#. Bleed down presence to Cf. Swabbed spent acid water and oil. Last two hours swabbed at rate of 744 EFPD, 98% water. (15 BOPD and 719 EMPD).
- 9-Me59 FBTD 56h1.50. Test DR plug with 3000%, held OK. Set pkr. at 56h5. Equeezed B. zone 5687 to 5692 and B. zone 572h to 572h with 65 sax/reg. cement, HOWO retarder added. Broke formation with 5 bols. wtr.

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- 9-11-59 PETD 5641.5° (Cont°d.) @ 1600%. Packer gave way 15 sax out in form COMMISSION cleared tool with water. Let set 3 hrs. Squeeze No. 2, B and BhE STATE OF MONTANA with 65 sax reg. coment, HOWCO reterder added. Broke formation with 5 bbls. water at 1800%. Squeezed 30 sax in csg. Reversed out 20 sax, top of cement at 5641.5. Made trip with the to remove packer and pick poit.
- 9-15-59 PBID 5686.5 Rigged up power swivel and drilled 450 of hard cement.
 Power swivel broke down.
- 9-16-59 FATD 5827. Repaired power swivel and drilled out 51.5° of hard cut.
 Total hard cement 96.5°. Note: Cement again lower than bottom perf.
 5714. Last 4° to DR plug seem to have cement strong down. Drilled off very fast. Circ. 3 hrs. to clean hole.
- PSTD 5827°. Pulled the and bit out of hole. Ran Baker retrievable Bridge plug on bottom of full bore packer. Set plug at 5730. Pulled up 3 joints and set full bore packer and tested squaree job on old perforations. Tested with 2600%. Held OK. Latched on to bridge plug and reset at 560. Pulled out 3 stands and Perforated Assume from 5524 to 5530. Picked up 1 stand and set packer at 5520°. Started stabbing at 4 7%. Hed live oil on 5th run with swab. Swabbad to bit approximately 60 bbls of fluid in 2 hrs. 20 to 30 percent oil.
- 9-18-59 PETD 58271. Released cacker, ran in 2 stands and cicked up retreivable bridge class. Palled tog out but did not have bridge class. Started in hole with tubing.
- 9-19-59 PETD 5827%, Ran the and rods and started well numping.
- 9=20=59 to
- 10-1-59 PHD 58271. Pump tested. Last test 17 80PD, 261 EMPD. Temporarily dropped from report.
- 10-26-59 FUID 5027 . Last test 362 EFPD, 81% water. (58 EOPD, 30% EMPD). Pulled rods.
- 10-27-59 PETD 58271. Rem Baker full bore backer with retrievable bridge plug. Set bridge plug at 5617. Tested with 300%. Svotied 1 sack gel on top of bridge plug. Set packer at 5521. Broke formation with 2610%. Displaced water with oil and DOC squared the A some terforations 5521 to 5530 with 60 sax Ideal regular cament with 5 gals. Hyflo mixed in 5 bbls. ahead. Maximum squares pressure 3200% with 36 sax cement in formation. Reversed out 25 sax, washed through and cleared terforations with 1.5 bbls. oil at 3200%. Broke back to 3050%. Job complete at 6100 PM, 10-27-59.
- 10-23-59 PETD 5827°. Set Baker full bore nacker at 5500°. and started symbling in mone 552kto 5530. Swabbed the dry. Made run with swab every 30 minutes for 2 hrs. Recovered approximately 1/3 bbl. fluid each run, no water. DCC in each sample. Third hour recovered no fluid. Cvere night fillup, 1700° in the (1000° oil and 700° water. Chl. 55,000° FFW.

- 10-29-59 PBTD 5827%. Swabbed A zone & hrs. recovering very small emport of wtr. Treated A zone 552% to 5530 with 250 gals. 7.5% HOWCO MCA CONSERVATION CONMISSION Scaled acid for 2 hrs. keeping pressure at 2000%. Inj. 1.75 bbls. In TAIL OF MONTAIN formation. Released and flowed back. Inj. 3 bbls. at 4 BPM at 3000%. Flowed back then injected remainder of MCA at rate of 4 BPM at 3000%. Flowed back, then inj. same back into formation at rate of 2 BPM at 3000%. Let set 30 min. Swabbed one hr. and tog. was dry. Made one dry run, then shut in on account of darkness.
- 10-30-59 PSTD 5827° Cvarnight fillum IRCO', ROOS water. Acidized A zone 552k to 5530 with 500 gals., 15% reg. acid. Acid started feeding at 2k00f. Inj. 2 bals. acid at rate of 2 BFH at 2k00f. Formation then broke back to 2200f. Inj. 4 more bals. at rate of 3 BFH at 2000f. Increased nume rate of 3 BFH, inj 5 bals at 2k00f than formation broke back to 2000f. Starped acid with 11 bals, in formation. Opened to pit. Spent acid to surface in 19 minutes. Flowed to pit 30 min. to clean up. Water cut 50%. One hr. test on 1 choke. Flowed at rate of 219 EFFD, 50% water, (109 EOFD, 110 EVFD) Tag. flow mress. 525%.
- 10-31-59 PEID 5027 . Tested 3 hrs. 291 BFPD, 50% water. (115 BOFD, 146 BWPD).
- FSID 5627 . Wired med. Willed well with 10.28 med. Released Baker full bore nacion. Picked up 3 jts. the Ran into bridge with 3rd jt. at 5700. Fick we on the and everything indicated that bridge olag was on the. Pulled 8 stands (1600) swabbing easing as culted. Valve in bridge olag evidently plagged with lost circulation material. Worked pipe 600 until tool quit swabbing easing. Came out of hole with the and did not have bridge plag. Ran the with retrieving head to fish IR plus. Unable to catch plus.
- 11-2-5; FEED 5827°. Himed med and circ. hole. Turn tog. with air tongs and circ. down to retrievable bridge plug. Pulled tog. and removed bridge plug. and retrieving head. Ram tog. with fishing tool to catch DR plug. Found bum 10° high (5732) according to tog. measure.
- Fig. 757 PETD 5827. Retained they with air tongs and wash down to DR olugo. Falled they to remove fishing tool and DR play. Well started flowing while error was making up Baker seal assy, and Otis choke nicple. Ran they in hole to condition mad. Mixed 75 obls. mnd.
- 11-1-59 FRI'D 5827%. Mixed and conditioned mud to 10.24 and killed well.
- PHID 5027%. Ran Baker seal assembly and Otis separation tool.

 Latched into packer at 5745. Spaced out and out on the head.

 Started in hole with second string, ran 20 jts,, (650), pickup line caught under slips and dropped A zone string with turned down collars in hole. Attempted to release no left turn latch on sub, would not release.
- 11-6-59 PRID 5827°. Ran Dia-Log free point indicator in C zone tbg., found tog. free to 5721. Ran string shot and backed off at 5685. (two joints above packer) Pulled tbg. out of hole. Went in hole with HOMCO overshot and found fish at 5096°. Recovered fish.

REGEINED

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- PHID 5827°. Went in hole with C zone thg. and screwed into collising STATE OF MONTANA Pulled 15,000% above weight of thg. Packer mandrel broke. Pulled out of hole and recovered inside of packer with seal easy. Ran junk basket and set Baker Model D packer on wireline at 5731.5°.
- 11-8-59 FAID 58271. Ran C and A zone the. in hole and hooked up K-mas tree.
- Pard 5827°. Attempted to pull Otis blank off tool. Sheared disk and ses unable to rull plug due to heavy mud plugging off and pressure would not equalize.
- PETD 5827°. Pressured up on C zone tbg. to equalize pressure 700° and philed Ctis blank off tool. Swabbed heavy mud and lost circulation material cut of C zone and some started flowing. Ram Otis aids door choks. Displaced salt water with oil on A zone, zone started flowing. C zone tbg press. 700°. A zone tbg. press. 300°.
- 11-11-59 PBID 58271. Chokes olugging on both A sad C zomes, no tests.
- 12-2-59 to
 12-2-59 PETD 5827. Tested A. zone. Last test, ownping 293 HFFD, 71% water.
 86 EOPD, 203 EMPD. Chlorides 115,000 PFM. Workover cotential of A.
 zone. To drop from report.

CHEMICAL & GEOLOGICAL LABORATORIES



CHEMISTS

GEOLOGISTS

ENGINEERS

P. O. BOX 279 CASPER, WYOMING

THE C. H. MURPHY JR., CORPORATION

WELL NO. 1 UNIT

C SW NE 2-28N-51E

MORRISON AND CHARLES SAND

EAST POPLAR, MONTANA



BOTTOM HOLE PRESSURE SURVEY

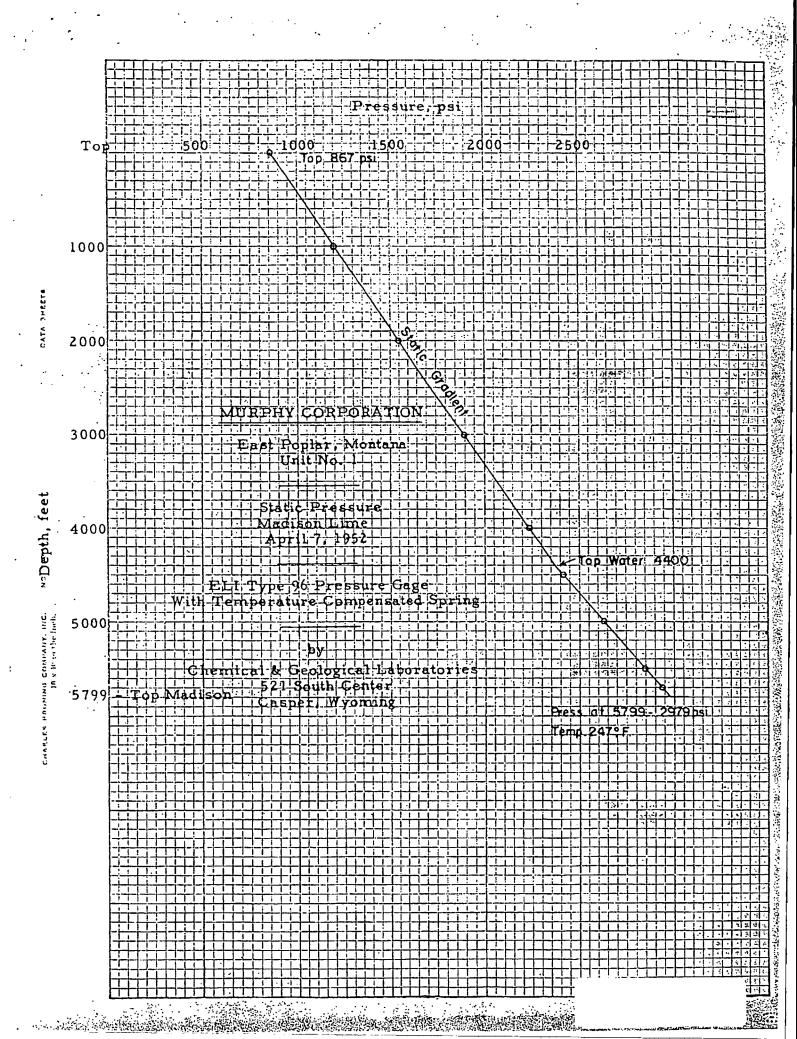
Static Test

	Statte	-	April 7 & 8, 1954
	•	Date	April 7 & 8, 1952
U.SQRATOMES	•		e and Well No. EPU No. 1 Montana
	Fast P	oplar Leas	Montana
Company Murphy Corpo Location C SW NE 2-28N	ration Field	Stat	P.O.
CompanyMurphy	Roosev	elt	
C SW NE 2-28N	-51E County	•	
Location			

	•				
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• • •	WELL DATA			ormation	3 . 10
			99 Top. L.	ormario.	100
2135 DF	ound Datum	Point:			
- 122 Gr	ound Datum			7 300	1. 5
Elevation: 2123			5799-584		
Flevacion	Perfor	ation:	19 7 19 1 1 2 2		
Madis	On		2070 761		```~``````````````````````````````````
Formation .			870 psi	Control of the Control	1. Pr. 3.
	Tubin	g Press		""三天人。	P.
5827					:
N.T. D.		- Dyacs			\$ 63°
1 Sec. 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	14 Casin	g Press			
					(i)).
Casing				1	<i>i</i> (3)
240 EU	E @ 5750			3.	iiiinn
Tubing				CVO	rnial
THOMB 'S TO SELECTION OF THE SELECTION O				1010	TINGS

	Tubing: 42			Information
			Gradient #/100	
		Pressure		
Depths	Extension Inches	867 psi	33.4	
Top Hole		1202	34.5	
1000	1.515	1547	34.7	
2000		1894	34.7	
3000	2.445	2241	36.2	
4000	2.910 3.150	2418	43.4	
4500	3.440	2635	44.0	
5000	3.735	2855	40.5	
5500	3.845	2936)	anolated)	
5700°.		2979 (extr	apo-	
5177	The state of the s		te below D.F.	

Well Shut In. All measurements below D.F. Temperature @ 5700 - 2440F. Extrapolated to 5799 - 2470F. Extrapolated in diaphragm of bomb. Remarks:





BOTTOM HOLE PRESSURE SURVEY . E-386 Flowing Pressure

Date April 7 & 8, 1952

Company Murphy Corporation Field East Poplar Lease and Well No. E.P.U. No. 1

Location C SW NE 2-28N-51E County Roosevelt State Montana . . .

WELL DATA:

2135 DF

Elevation: 2123 Ground Datum Point: 5799 Top Formation

Formation: Madison Perforation: 5799-5827

VT. D. 5827 Tubing Press: 775 psi

Casing 7. @ 5814 Casing Press

Tubing: 2½' EUE @ 5750

				Additional
. Depths :	Extension Inches	Pressure	Gradient #/100': 👙	<u>Information</u>
Top Hole	0.940	722 psi .	35.8	
1000	1.420	1130	36.1	
2000	1.905	1491	36.9	
3000	2.400	1860	34.9	
4000	2.870	2209	34.2	
4500	3.100	2381	34.4	
5000	3.340	2558	35.2	
5500	3.575	2734	35.1	
5700	3.670	2805		
5799	19 jun	2840 (extra	polated)	

Remarks:

Well flowing on 10/64" choke @ 448 bbls. per day rate (last 2 hr. ave. Uncorrected gas volume - average last 2 hours - 6050 C.F. daily. All measurements from D.F.



E-386 BOTTOM HOLE PRESSURE SURVEY Flowing Pressure

	Date	April 7 & 8, 1952	
Company Murphy Corporation Field East Poplar	Leasc	and Well No. E.P.U. No.	o <u>. 1</u>
		•	•

Location C SW NE 2-28N-51E County Roosevelt State Montana

WELL DATA:

2135 DF

2123 Ground

Datum Point:

Formation:

Elevation:

Perforation:

Tubing Press:

Casing Press:

Depths	Extension Inches	Pressure	Gradient #/100	Additional
Top Hole	1.025	. 835 psi	25.0	
1000	1.505	1193	35.8	
2000	1.985	1550	35.5	
3000	2.460	1905	35.3	
4000	2.935	2258	35.0	
4500	. 3.170	2433	35.6	en este la la la la la la la la la la la la la
5000	3.410	2611	35.6	
5500	3.650	2790	35.5	
5700	3.745	2861		
5799		2897	(extrapolated)	

Remarks:

Well flowing on 8/64" choke @ 358 B.O.P.D. rate (last Uncorrected gas volume - 4300 c.f. daily.

All measurements from D. F.



BOTTOM HOLE PRESSURE SURVEY E-38

Flowing Pressure

Date April 7 & 8, 1952

Company Murphy Corporation Field East Poplar Lease and Well No. E.P.U. No. 1

WELL DATA:

2135 DF

Location C SW NE 2-28N-51E County Roosevelt State.....

Elevation: 2123 Ground Datum Point: 5799 Top Formatio

Formation: Madison Perforation: 5799-5827

N.T. D.: 5827 Tubing Press: 910 psi

Casing: 7° @ 5814 Casing Press:

Tubing: 2½" EUE @ 5750

Depths E	xtension Inches	Pressure		Additional nformation
Top Hole	1.100	892 psi		
1000	1.560	1234	34.2	
2000	2.030	1584	35.0 36.9	
3000	2.525	1953	36.4	
4000	3.015	2317	36.0	
4500	3.255	2497:	35.4	
5000	3.495	2674	34.4	
5500	3.725	2846	37.0	A Separate
5700	3.825	2920		Windowski (Marie Marie Marie Marie Marie Marie Marie Marie Marie Marie Marie Marie Marie Marie Marie Marie Mari
5799		. 2957 . (extrap	olated)	

Remarks:

Well flowing on 6/64" choke @ 147 B.O.P.D. rate (last 2 hr. ave.).

Uncorrected gas volume - 2760 cu. ft. daily.

All measurements from D. F.

